A STUDY OF THE CHANGING OCCUPATIONAL COMPOSITION AND EDUCATIONAL ATTAINMENT OF THE LABOUR FORCE IN NEWFOUNDLAND

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by

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ABSTRACT

Changes in the occupational composition of any labour force over time are the outcome of two distinct processes, namely, the shifting distribution of employment among industries due to changes in demand and, secondly, evolution in the occupational pattern within individual industrie due to changes in production function and technology and in relative factor-prices. Economic development imposes varying mix of occupations that is compatible with the new and advanced methods of production. This progress creates inevitable changes in quality and quantity of various occupations. Given these complex forces that determine the occupational composition, this study attempts an analysis of (1) the changing occupational composition of the labour force in Newfoundland since 1945, (2) general causes of the occupational changes in terms of supply and demand, (3) the likely occupational composition of the provincial labour force in 1971 and, finally, a general assessment of the educational attainment of the labour force during 1945-61.

Chapter I deals with concepts, scope and methodology.

Chapter II analyzes the changing occupational composition of the provincial labour force in the context of occupational changes in the Canadian and the Nova Scotian labour forces.

Chapter III attempts a supply and demand analysis of the changing occupational composition in the province.

Chapter IV deals with a projection of the occupational composition of the provincial labour force in 1971.

Chapter V gives a general assessment of the educational attainment of the labour force.

ACKNOWLEDGEMENT

The importance of a study of the occupational changes in the Province of Newfoundland in forecasting the manpower requirements of the province at some future date was indicated to me by Professor S. S. Mensinkai who kindly agreed to supervise this work. I am grateful to Professor Mensinkai, without whose kind encouragement and able guidance this study would not have been possible. I also express my thanks to Professor N. Hurwitz for his valuable suggestions and comments made during the course of this study. My thanks are also due to Mr. Peter Hood for technical assistance. However, I am solely responsible for the opinions expressed.

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CHAPTER I

INTRODUCTION, SCOPE AND CONCEPTS

The fundamental structural change of any labour force is a gradual process, reflecting basic social, technological and economic changes. In the long run, changing occupational composition of the working population is among the most revealing indicators not only of economic development but also of social structure. Changing occupational composition, reflecting as it does, the gradual remoulding of the labour supply to the pattern of labour demand, is the result of a number of fundamental growth trends in the economy. On the demand side two broad sets of factors underlie the long-run occupational transformation of the labour force: differing rates of growth of different industries and modification of the occupational structure within individual industries. Shifts in the industrial distribution of the labour force stem from a wide complex of forces shaping the final demand for goods and services and hence the derived demand for labour. Within industries, occupational requirements respond to a great variety of pressures of which the most pervasive and compelling is technological change. Thus, over the long run, as some industries grow and others decline, as new industries emerge and expand, and as technological innovation transforms methods of production, so the demand for workers of differing degrees and kinds of ability, education and training is gradually altered. The occupational composition of labour force reflects changes in labour supply also. Over a long period of time, as occupational manpower requirements change, the occupational choices of workers are gradually refashioned in accordance with those changing requirements.

The educational institutions of the community play a dominant role in the complex process of occupational choice, and thereby promote a more effective adjustment of labour supply to demand. Since the process of adjustment is highly imperfect and in any case never instantaneous, at any given time, shortages or surpluses of particular groups of workers will arise, and the market will register these disequilibria in a variety of ways of which the most important is price change, i.e., changes in the relative wages paid to differing occupational groups. The price changes will, of course, in turn affect the occupational composition of industries as employers seek to substitute less for more expensive labour. A full-scale analysis of occupational change - integrating changes in final demand; deployment by industry; prices and intra-industry occupational structure - is far beyond the scope of this study as we do not know the production functions of the various industries or the demand curves for their products. Given the complex of underlying forces which shape the occupational distribution of labour force, an attempt will be made to trace their combined effects in transforming the occupational pattern of the Newfoundland's working population over the course of the past twenty-five years, and to project the occupational composition for 1971 on the basis of the past trends.

While the first chapter deals with the scope, concepts, methodology and the general background to the study, the second chapter analyzes the changing occupational composition of the Newfoundland labour force in the background of the changing economic conditions since 1945; this is followed by a comparative study of the occupational changes between the Newfoundland labour and those of Canada, as a whole, and Nova Scotia with a view to ascertain the time-distance between the Provincial labour force

and those of Canada and Nova Scotia in terms of occupational composition. This is followed, in the third chapter, by a supply and demand analysis of the occupational composition with a view to ascertain whether shifts in demand and supply were primarily responsible for changes in the occupational composition of the Provincial labour force between 1945 and 1961. The fourth chapter concentrates on a projection of the occupational composition to the year 1971, based on the past trends. The final section attempts a general assessment of the changing educational attainment of the Provincial labour force since 1945 within the Canadian context.

METHODOLOGY

The methodology used is historical and statistical in nature. It is historical in the sense that the growth of different occupations, changing occupational composition and educational attainment will be analyzed in the context of developments over the last two decades. A statistical approach implies a presentation of available statistical evidence, whenever possible on which the analysis of changing occupational structure and educational levels is based. Statistical methods are used in making projection of the occupational composition of the labour force to 1971. The main sources of data are the census of Newfoundland 1945, census of Canada, 1951 and 1961.

THE OCCUPATION AND INDUSTRY GROUPS

The classification of the labour force by occupation implies groupi together of all individuals of a given profession or craft irrespective of the industries in which they may be working. The characteristics which identify an occupation are the functions, tasks and duties involved in the

job. However, there is no fixed classification of occupations based on the type of work a person performs. Changes in technology and structure of the economy give rise to new occupations while older occupations disappear or have their functions completely altered. Hence there are bound to be continuing changes in what constitutes an occupation and how specific occupations are grouped together. For example, the 1961 occupational classification of the Census of Canada is "a revision of the 1951 Census Classification of Occupations and the grouping system is quite different from that used in 1951, but many of the occupational classes remain unchanged. Some classes have been added to take account of new developments (e.g., Class 198 Science and Engineering technicians, not elsewhere specified (n. e. s.)) and others have been discontinued, because they have become relatively less important (e.g., harness and saddle makers, coopers)".[1]

In addition to the changes in the specific occupations recorded in the Census of Canada, there is a general evolution in the classification basis which merits attention. A complete population census has been conducted in Canada at decennial intervals since 1871. Up to and including the 1921 census, the type of work persons performed was classified on the basis of a mixture of job function and the type of goods or services produced. There was no separate identification of occupation and industry. In 1931, the published tables on the work force showed persons classified both by occupation and industry. However, many of the occupation groups were given industrial titles based on the industry in

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1. Dominion Bureau of Statistics, Occupational Classification Manual, Census of Canada, 1961, 1963, p. 8.

which most of the jobs in the occupation group were located. The classification basis changed with each census until in 1961 there were only two occupation groups with the same titles as industries: transportation and communication; and service.

In order to undertake a study of changes in occupational composition, a single classification system has to be selected and efforts made to try to adjust the occupation data in all other censuses to a common basis. If the data are not on a consistent basis, then the real changes in numbers of persons in an occupation cannot be separated from the changes arising from different methods of classification. For Newfoundland, occupational data are available for only three census years, namely, 1945, 1951 and 1961, and the occupational classification of the 1961 census is used in this study, as there are fewer occupations with industrial titles than either in the 1945 or the 1951 classifications.

THE OCCUPATIONAL GROUPS OF THE 1961 CENSUS

There are generally three levels of aggregation in which occupations are presented. At the broadest levels are the major occupational groups which divide the world of work into a dozen or so functional areas. These major groups are broken down into from 50 to 300 minor groups depending on the particular classification basis. The minor groups, in turn, are made up of a number of unit groups. In this study the major twelve occupation groups are used.

The occupational classification manuals prepared for the decennial censuses contain only occupation titles with no definitions of the occupations. In describing the twelve occupations which will be used in this study, examples of specific occupations contained within each group along

with definitions which were adapted from the International Standard Classification of Occupations[1] are used. The following are the twelve occupation groups used in the study:

(a) Managerial occupations: This major group includes owners, managers, and officials in all industries; working proprietors are also included in this group.

(b) Professional and technical occupations: Workers in this group conduct research and apply, in a professional capacity, scientific knowledge and methods to a variety of technological, economic, social, industrial and governmental problems, carry out technical tasks auxiliary to scientific research, development, and practice and perform religious, educational, legal, artistic and literary functions. Those classified in this major group perform tasks which usually require training in a specific or professional field, at a university, technical institute or similar establishment or which require creative ability in literature or art or talent in entertaining.[2]

(c) Clerical Occupations: Workers in this group compile and maintain records of financial transactions and other business activities, handle cash on behalf of an organization or its customers, record oral or written matter by shorthand writing and typing, operate various kinds of office machines and perform other clerical tasks.[3]

(d) Sales Occupations: This group of work force includes persons who are engaged in or directly associated with selling goods and services

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1. Prepared by the International Labour Office, Geneva, 1958.
2. ILO, International Standard Classification of Occupations, Geneva, 1958, p. 27.
3. Ibid., p. 60.

of all kinds. In addition, this category includes occupations identified with insurance, real estate and other financial areas of work. Some examples of sales occupations are: commercial travellers; sales clerks; service station attendants; purchasing agents and buyers; packers and wrappers; insurance agents; real estate agents and dealers, stock and bond brokers.

(e) Craftsmen, production process and related workers: This major group includes workers engaged in or directly associated with manufacturing process and the construction, maintenance and repair of various types of highways, structures, machines and other products. This group includes workers in the traditional craft trades.

Some examples of craftsmen, production process and related workers are: shoemakers and repairers; dressmakers, compositors and type setters; fitters and assemblers; mechanics and repairmen; sheet metal workers, welders and flame cutters; stationary engineers; brick and stone masons; carpenters, electricians; plumbers and pipefitters; painters, decorators.

(f) Labourers: This major group includes workers, outside farming, fishing, logging or mining occupations, who perform tasks requiring primarily physical effort. For example: bottle washers, body hangers, drain cleaners, feeders etc.

(g) Transportation and Communication Occupations: Work force in this major group is directly concerned with the movement and control of means of transporting passengers and freight, and with transmission of communications.[1] Occupations which are included in this category are:

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1. Ibid., p. 83.

air pilots, baggagemen and expressmen; bus drivers; chauffeurs; taxi drivers; locomotive foremen; postmen and mail carriers; radio and television announcers, broadcasters, telegraph operators; telephone operators.

(h) Service and Recreation Occupations: Workers in this category include those who are directly concerned with protective, recreational, personal and domestic services. A few examples of specific occupations in this group are: guards, watchmen; policemen and detectives; barbers; hairdressers; charworkers and cleaners; janitors and sextons; practical nurses, waiters and waitresses; cooks etc.

(i) Farmers and Farm Workers: Workers in this major group work directly in or assist in agricultural activities to raise and harvest crops and to breed or care for animals. Some of the major occupations in this category are: farmers and stock raisers; foremen and farm labourers; flower growers and landscape gardeners.

(j) Loggers and related workers: This occupational group includes workers in forestry activities who cultivate and preserve forests and gather forest products. The occupation classes within this group are: logging foremen; forest rangers and timber cruisers, lumbermen (including labourers in logging).

(k) Fishing Occupations: Workers in this group work directly on or assist in fishing or related activities to catch, gather and breed fish or other forms of aquatic life. This group also includes persons engaged in hunting and trapping.

(l) Mining Occupations: Labourers in this major group are engaged in the extraction of solids, semi-liquids, liquids and gases from the earth, and their treatment prior to direct use or further processing.

Included in this group are: miners; prospectors; labourers (miner); quarriers; drillers; rock and oil wells, foremen-miner, quarries, oil wells.

These twelve occupation groups are further regrouped in this study into five major groups, namely, White Coller, Blue Collar, Primary, Transportation and Communication, and Service and Recreation Occupations. The white collar category is made up of the following occupational groups: proprietary and managerial; professional and technical; clerical; sales. These groups include most of the workers whose jobs primarily involve mental rather than physical effort.

In the category of blue collar or manual workers there are two occupational groups; craftsmen, production process and related workers and labourers outside the primary industries. These occupations cover the bulk of the physical work performed in the non-primary industries.

Primary occupations include the manual job associated with agriculture, forestry, mining and fishing.

Transportation and communication occupations include the types of work associated with the moving of persons or goods from one place to another, or the transmitting of ideas through radio and television, telegraph and by mail. Service and recreation occupations, on the other hand, include the types of work outside the professional area where labour is purchased directly by the ultimate consumer; the sub-categories within this sector are: personal, domestic, protective and others. It is in terms of these twelve major occupational groups and their five broader categories that occupational composition has been defined in this study as the percentage distribution of the labour force among these occupations.

THE INDUSTRY GROUPS

An industry is traditionally defined as a group of establishments producing similar types of goods and/or services. The industrial classification basis used in the 1961 census is selected and, just as with occupations, only the major groupings are used. The following eleven industrial groups are included in the study: Agriculture; Forestry; Fishing, trapping and hunting; Mining, Quarrying and Oil Wells; Manufacturing; Construction; Electricity, gas and water; Transportation and Communication; Trade; Finance, Insurance and Real Estate; and Services.

Since the products of most industry sectors are generally well-known, one has to provide definitions and examples only for the service industries. The service industries include community and business services, government, recreation and personal services. The community service sector includes such areas as education, health, religion and welfare institutions. In addition, other public service establishments are included such as art galleries, museums and public libraries. The business service category includes accountancy, advertising, engineering and scientific services, labour organizations, and trade association, law and other establishments primarily engaged in the provision of business services. The main divisions within the government service sector are: dominion; provincial; municipal and other local governments. Recreation service includes theatres and theatrical services, along with amusement parks, auditoriums, orchestras, billiard rooms, bowling alleys, etc. Personal service covers such areas as barbering, domestic service, hotels and lodging houses, laundries, restaurants, undertaking and other personal services.

INDUSTRIAL STRUCTURE OF EMPLOYMENT AND CROSS CLASSIFICATION OF OCCUPATION AND INDUSTRY DATA

The industrial distribution of the labour force reflects industrial structure of an economy which is subject to evolution. The cross-classification of occupation and industry labour force data reflect the distribution of each industry's labour force among different occupations as determined mainly by technology and relative prices of factor-inputs. Both distributions are given in this section (in percentage terms) to provide some background information to the analysis of occupational changes. During the past few decades, the industrial basis of the Newfoundland economy has been widened by the growth of some industries and decline in others which involved changes in the industrial distribution of the province's labour force. Industrial shifts have occurred, as revealed in Table I-1 from primary (agriculture, fishing and forestry) to secondary (manufacturing and construction) and tertiary (transportation and communication, trade, finance, insurance and real estate, and services) sectors of production as a result of changing markets, changing consumption and investment patterns and technological progress. Table I-1 presents numerical and percentage distribution of the Newfoundland labour force by industry for the census years 1945, 1951 and 1961, adjusted to the 1961 census industrial classification. Between 1945 and 1961, the relative shares of agriculture, forestry and fishing in the total labour force declined from 3.7 percent, 6.8 percent and 28.3 percent respectively to 1.3 percent, 5.6 percent and 15.3 percent, whereas the relative size of the mining group rose from 2.7 percent in 1945 to 3.5 percent in 1961. The share of the primary sector as a whole declined sharply from 41.5 percent to 25.7 percent; i.e. by 15.8 percentage points during this period.

Table I-1

NUMERICAL AND PERCENTAGE DISTRIBUTION OF LABOUR FORCE
IN NEWFOUNDLAND, BY INDUSTRY,
AS OF OCT. 1, 1945,
JUNE 1, 1951 AND JUNE 1, 1961

Industry	1945		1951		1961	
	Total	%	Total	%	Total	%
All industries	112508	100.0	106411	100.0	122677	100.0
Agriculture	4179	3.7	3514	3.3	1641	1.3
Forestry	7606	6.8	10532	9.9	6891	5.6
Fishing and Trapping	31878	28.3	18420	17.3	18756	15.3
Mines, Quarries and Oil Wells	3002	2.7	3661	3.4	4293	3.5
Manufacturing	10588	9.4	13926	13.1	12168	9.9
Construction	6174	5.5	5465	5.1	9525	7.8
Transportation, Communication and other utilities	8392	7.5	12718	12.0	15213	12.4
Trade	7817	6.9	14691	13.8	18928	15.4
Finance, Insurance and Real Estate	407	0.4	610	0.6	1432	1.2
Services: Community, Business, Personal Services, Public Administration	21856	19.4	21517	20.2	30342	24.8
Unspecified	10609	9.4	1357	1.3	3488	2.8

Source: Census of Newfoundland, 1945, Table 52; Census of Canada, 1961: Industry and Occupation Trends (94-551), Table 12.

The share of the secondary sector increased from 14.9 percent to 17.7 percent. However, the biggest shift in the industrial structure of employment occurred in the case of tertiary sector during 1945-1961; the relative share of this group as a whole rose by 19.6 percent. The largest shifts occurred in the case of Trade (8.5 percent), Services (5.4 percent) and transportation, communication and other utilities (4.9 percent). However, one has to take note of the fact that some of these shifts might be partly spurious. As is evident from Table I-1, as large as 9.4 percent of the total labour force was in the unspecified category in 1945, and it is quite probable that much of it was in trade. Even then, one could conclude that during the period under consideration the shares of the secondary and tertiary sectors in the total labour force recorded positive shifts whereas the share of the primary sector declined. If we assume that these trends have continued during the sixties, their impact on the occupational composition of the labour force as a whole is evident. Because, as each industry has a different occupational structure of its labour force, as will be clear shortly, shifting industrial distribution of the labour force will have a direct effect on the total occupational composition of the labour force. The declining share of the primary sector in the total labour force and rapidly increasing shares of the tertiary and secondary sectors have produced their impact, as will be seen in Chapter II, on the over-all occupational composition in favour of white collar workers as against primary occupations.

CROSS-CLASSIFICATION OF OCCUPATION AND INDUSTRY DATA

The cross-classification of occupation and industry labour force data reflects the distribution of each industry's labour force among different occupations. Table I-2 presents the percentage distribution

Table I-2

PERCENTAGE DISTRIBUTION OF THE LABOUR FORCE IN INDUSTRIAL SECTORS, BY OCCUPATION GROUP, NEWFOUNDLAND, AS OF OCT. 1, 1945, JUNE 1, 1951 AND JUNE 1, 1961

	Years	All occupations	Managerial	Professional and Technical	Clerical	Sales	Service and Recreation	Transportation and Communication	Farmers and Farm Workers	Loggers and related workers	Fishermen, Trappers & Hunters	Miners, Quarrymen etc.	Craftsmen, Production etc.	Labourers
All Industries	1945	100.0	3.7	4.2	4.4	3.4	12.3	5.6	3.8	6.5	27.7	1.8	15.1	7.7
	1951	100.0	6.4	5.1	6.3	5.0	9.9	10.1	3.3	8.6	17.3	2.1	19.0	8.0
	1961	100.0	7.8	8.3	8.8	6.2	11.7	8.1	1.4	5.1	15.3	2.0	20.9	6.3
Agriculture	1945	100.0	0.0	0.1	0.0	0.0	0.0	0.0	99.5	0.0	--	--	0.0	0.0
	1951	100.0	0.7	0.3	0.1	0.0	0.1	0.4	96.9	0.1	--	--	0.3	1.1
	1961	100.0	1.4	0.5	0.2	0.1	0.1	1.6	92.4	0.1	--	--	1.6	1.4
Forestry	1945	100.0	1.0	0.2	0.6	0.0	3.9	1.5	0.0	89.8	--	--	2.0	0.5
	1951	100.0	1.5	0.4	0.8	0.2	4.8	4.5	0.6	82.1	--	--	3.8	1.3
	1961	100.0	1.5	0.5	0.3	0.0	4.4	3.8	0.2	81.9	0.1	--	5.7	2.0
Fishing and Trapping	1945	100.0	0.1	0.0	0.1	0.0	0.1	0.2	--	--	97.8	--	1.1	0.2
	1951	100.0	0.2	0.1	0.1	0.0	0.6	0.7	--	--	97.2	--	0.6	0.5
	1961	100.0	0.1	0.3	0.1	0.0	1.5	0.8	--	--	95.9	--	0.4	0.8
Mining, Quarrying and Oil Wells	1945	100.0	0.6	1.9	3.6	0.0	3.8	4.6	0.0	0.0	--	65.7	17.8	2.5
	1951	100.0	0.8	2.6	4.9	0.0	4.2	5.2	0.1	0.1	--	59.0	19.6	3.4
	1961	100.0	1.7	3.7	6.5	0.0	4.8	4.3	0.1	0.0	--	45.6	27.0	6.2
Manufacturing	1945	100.0	3.4	2.2	5.7	1.5	1.4	2.6	0.1	1.8	0.0	--	61.0	18.5
	1951	100.0	6.0	2.2	7.4	1.9	2.0	6.6	0.2	2.5	2.0	--	51.6	17.6
	1961	100.0	7.4	3.0	7.5	1.2	1.7	3.8	0.1	0.2	0.9	0.1	59.1	17.8
Construction	1945	100.0	0.9	0.3	0.9	0.0	3.4	2.4	0.0	0.0	--	0.2	72.2	18.9
	1951	100.0	2.3	0.7	2.0	0.2	2.1	6.4	0.0	0.1	--	0.4	51.0	34.9
	1961	100.0	3.3	1.3	3.1	0.1	1.7	6.8	0.1	0.0	0.0	1.8	58.9	22.9
Transportation, Communication and other utilities	1945	100.0	1.0	0.5	4.3	0.1	5.1	73.9	--	0.0	--	0.0	5.5	8.1
	1951	100.0	3.5	1.2	7.0	9.2	7.0	59.4	--	0.3	--	0.1	10.7	10.2
	1961	100.0	6.2	2.0	11.3	0.2	5.5	30.6	--	0.0	--	0.3	35.0	8.9
Trade	1945	100.0	31.2	1.3	10.9	45.0	0.4	4.5	--	0.0	--	--	2.7	3.2
	1951	100.0	25.9	0.9	11.2	32.7	1.5	8.8	--	0.5	0.9	--	10.3	7.2
	1961	100.0	25.8	1.4	12.7	33.6	1.1	6.1	--	0.0	0.0	--	14.1	5.1
Finance, Insurance and Real Estate	1945	100.0	14.7	2.9	53.3	24.0	1.9	1.2	--	--	--	--	1.4	0.2
	1951	100.0	15.1	4.6	58.0	16.4	3.1	1.0	--	--	--	--	0.7	1.1
	1961	100.0	18.2	6.8	60.2	15.2	2.5	0.8	--	--	0.0	0.0	0.7	1.5
Services	1945	100.0	4.1	19.8	6.6	0.2	52.6	3.1	0.1	1.0	--	0.0	6.4	4.7
	1951	100.0	6.0	21.4	11.4	0.9	38.5	4.1	0.2	0.1	--	0.0	11.0	6.4
	1961	100.0	5.3	26.5	10.8	0.8	36.3	4.2	0.0	0.1	--	0.0	10.2	5.7
Unspecified	1945	100.0	13.2	8.1	15.5	5.7	55.6	--	--	--	--	--	0.0	1.9
	1951	100.0	--	--	--	--	--	--	--	--	--	--	--	--
	1961	100.0	20.9	11.3	15.2	2.4	32.2	1.5	0.0	--	--	--	11.6	4.8

Sources: Census of Newfoundland and Labrador, 1945; Table 2; Census of Canada, 1951, Vol. IV, Table 16; Census of Canada, 1961, Vol. III, Part 2, Table 15.
(0.0) refers to insignificant percentage and (--) refers to non-availability or no figures existing.

of each industry's work force among different occupations for the years 1945, 1951 and 1961. It is very clear that in all the industries certain occupations form a high proportion of the total labour force. In the primary sector, primary occupations represent a significant proportion of the labour force. For example, in agriculture, farmers and farm workers represent more than 90 percent of the work force; loggers and related workers form more than 80 percent of the work force in forestry, whereas in fishing and trapping, more than 95 percent of the work force is represented by fishermen, trappers and hunters. In the case of mining groups, the bulk of the work force is in the category of miners, quarrymen and related workers. Similarly, craftsmen, production process and related workers represent more than half of the labour force in manufacturing and construction industries. Transportation and communication occupation and craftsmen, production and related workers dominate the labour force in transportation, communication and other utilities; a major part of the work force in the service sector is in the category of service and recreation occupations, and professional and technical workers. While the trade sector is dominated by sales and managerial occupations, clerical workers make up over half of the number of persons in the finance sector. The broad picture that emerges is that while the primary occupations represent the bulk of the labour force in each one of the primary industries, blue collar workers (craftsmen, production process and related workers and labourers) dominate the work force in the secondary sector (manufacturing and construction industries); white collar workers make up the bulk of the labour force in trade and finance. Transportation, communication and other utilities are dominated by transportation and communication occupations and the blue collar category; service and

recreation workers and the white collar group make up the major percentage of the work force in the service sector.

Another major fact that emerges from Table I-2 is the different trends of the occupational structures of each industry over the period 1945-1961. In all the four primary industries, while primary occupations represent the bulk of the labour force, the trend over the period is one of declining proportion of primary occupations and rising percentage of white collar, blue collar, transportation and communication, and service and recreation occupations. The trend in the case of the secondary sector is in the direction of increasing proportion of white collar, transportation and communication workers and declining percentage of blue collar category. The transportation group of industries show a declining trend of the transportation and communication workers and a rising proportion of blue collar and white collar groups of workers; in the case of trade, the proportions of blue collar and transportation and communication workers have been increasing at the cost of white collar category. In the finance sector, white collar workers have maintained their dominant position in the total labour force during this period. The service sector exhibits a declining trend in the proportion of service and recreation occupations and an increasing share of white collar and blue collar groups. The overall pattern of the occupational composition and its changes over the period 1945-1961 are not clear from the above analysis of the industrial distribution of labour force and the trends of the occupational structures in each industry. A detailed study of the occupational composition of the total labour force and its shifting patterns will be made in the next chapter.

CHAPTER II

CHANGES IN OCCUPATIONAL COMPOSITION AND GENERAL ECONOMIC DEVELOPMENT IN NEWFOUNDLAND SINCE 1945

This chapter has two objectives: (1) to describe the principal changes which occurred between 1945 and 1961 in the occupational composition of the Newfoundland labour force, and (2) to briefly sketch the significant economic development in Newfoundland during the period.

The objective of the first part is to analyze the changes in the occupational composition from 1945 to 1961 against those of the Canadian and the Nova Scotian labour forces with a view to ascertaining the time-distance in terms of occupational structure between the Newfoundland labour force and those of Canada and Nova Scotia. Secondly we analyze the general economic development in Newfoundland during this period with a view to throwing some light on the trend of economic activity. Organizationally, the general economic development are considered first, followed by an analysis of occupational changes.

GENERAL ECONOMIC CONDITIONS SINCE 1945

Since most of the data in this study are derived from the censuses, some observations are in order concerning the economic conditions of each of the census years. As is well known, the economy of the province rests primarily upon three industries, fishing, forestry and mining. Extensive agricultural development has not been possible because of the generally unfavourable soil and climatic conditions. Industrialization has been limited by the restricted nature of the home market. The production of

its basic industries, which is far in excess of domestic requirements, is geared to the demand in export markets.

The 1945 census showed that 35 percent of the total population was gainfully occupied, and that over 41 percent of the gainfully occupied were engaged in the primary industries - fishing, forestry, mining and agriculture, with fishing (28 percent) far in the lead.

With such large numbers of the population dependent on the fishing industry, it is apparent that any fall in the demand for fish has great repercussions on the province. A very high rate of unemployment persisted throughout the 1930's, mainly due to the poor demand and low prices for fish exports. Statistics of the numbers receiving Government assistance show that, prior to the outbreak of the war, as high as one-sixth of the total population was, at times, on relief.[1] The wartime stimulus to Newfoundland's basic industries, particularly the renewed demand and high prices for fish, the enlistment of a large proportion of Newfoundlanders of military age, and the construction of large defence bases by the United Kingdom, Canada and the United States, resulted in a high level of prosperity during the war years.[2] Production and trade expanded greatly, employment reached an all-time record. In 1945, the gross provincial product at current prices stood at $120 million.[3] Towards the end of the 1940's, however, there were indications of less favourable economic conditions with a lower fish catch in 1948, the cessation of work on various

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1. Dominion Bureau of Statistics, Province of Newfoundland: Statistical Background, (Ottawa) 1949, p. 63.
2. Ibid., p. 63.
3. Ronald, Ross and Co.: Industrial Survey of Newfoundland, (Montreal) 1959, Vol. 1, p. 92.

construction projects and some slackening of activity due in part to uncertainties associated with the impending confederation with Canada.[1] There was a great surge in economic activity in 1951 induced by the outbreak of hostilities in Korea in mid-1950 and a sharp increase in government expenditure under federal assistance. There was a sharp rise in capital investment expenditure from $32 million in 1949 to $59 million in 1951, an increase of more than 80 percent in two years.[2] The result was a substantial increase in GPP and the lowering of unemployment. While GPP rose from $177 million in 1949 to $227 million in 1951, an increase of 28 percent in two years (in current dollars), the rate of unemployment declined sharply from 13.3 percent in 1950 to 7.5 percent in 1951. During the early and mid 1950's the provincial economy was operating closer to capacity and the average rate of unemployment during 1951-1956 was about 6.5 percent. In 1953, the unemployment ratio reached its lowest point since Confederation, when it declined to 5.8 percent.

However, beginning with the recession in early 1957, the provincial economy experienced a severe slow down in economic activity which continued into the early 1960's. The unemployment rate averaged about 16.3 percent during 1957-1963, reaching a peak of 20.4 percent in 1961. There has been a substantial improvement in the economic situation since 1964, although the rate of unemployment averaged about 11.9 percent during 1964-1968. However this high unemployment ratio could be explained in terms of an increasing labour force since 1962: the volume of labour force increased

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1. Dominion Bureau of Statistics, op. cit., p. 63.
2. Sources: Investment figures are taken from the Department of Trade and Commerce, Ottawa, Private and Public Investment in Canada; GPP figures are taken from Economics and Statistics Division, Department of Finance, Government of Newfoundland and Labrador; labour force data are taken from DBS: Labour Force, Catalogue No. 71-001.

from 117 thousand in 1962 to 144 thousand in 1968, an increase of more than 23 percent.

By looking at the three census years, it can be seen that while two years represent a phase of economic upswing, one represents a period of recession. 1945 was a year of vigorous upswing under the stimulus of war demand; 1951 was also a year of great surge in economic activity generated by the Korean war and federal assistance; 1961 was the trough of a recession. It is against the background of this analysis of economic conditions since 1945 that a study of occupational changes becomes realistic.

OCCUPATIONAL TRENDS: CHANGES IN COMPOSITION - 1945-1961

Changes in the occupational composition or the percentage distribution among occupations of the total labour force over time are the outcome of two distinct processes, namely, the shifting distribution of employment among industries due to changes in demand for their products and secondly, evolution in the occupational pattern within individual industries due to changes in production function and technology and in relative prices of factors used.[1] Economic development imposes varying mix of occupations that is compatible with the new and advanced methods of production. This progress creates inevitable changes in the quantity and quality of various occupations. Given these complex forces that determine the occupational composition, an attempt is made in this chapter to analyze the significant changes in the occupational composition of the labour force in Newfoundland during 1945-61. Of course, the full signifi-

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1. Noah M. Meltz: Changes in the Occupational Composition of the Canadian Labour Force, 1931-1961, Economics and Research Branch, Department of Labour, Canada, 1965, p. 3.

cance of the transformation of the Newfoundland labour force could be grasped only by analyzing the shifts over a long period of time, but the non-availability of the occupational data for the period earlier to 1945 restricts the analysis to 1945-1961. While the analysis is made in terms of the occupational classification of 1961 census, one category has not been taken into account, namely, persons with occupations unspecified.

Table II-1 provides a numerical and percentage distribution of the labour force among different occupations in 1945, 1951, and 1961. What stands out most clearly from the table is that the shift away from fishing, trapping and hunting has been the single most dramatic change that has occurred in the Newfoundland labour force since 1945. This shift would have been much more clear if we had data from the beginning of the present century. Not long ago, Newfoundland was largely a fishing community. While it is true, as revealed by Table II-1, that by 1945, a majority of Newfoundlanders were engaged in non-fishing pursuits, fishing occupations were far and away the largest single group in the economy (nearly 28 percent of the work force), and fishing activity was the single most important form of work. Fishing and other resource-based occupations comprised almost 40 percent of the work force and represented more than 44,000 workers in 1945. The number engaged in primary occupations continued to decline from 44,684 workers in 1945 to 28,411 workers in 1961, a fall of 36 percent; their relative decline was also sharp when this group as a whole fell from nearly 40 percent of the work force to 23 percent during this period. Looking at fishing only, the absolute as well as relative decline in size was so steep since 1945 that fishing lost its place as the largest single occupational activity in Newfoundland. We may

Table II-1

NUMERICAL AND PERCENTAGE DISTRIBUTION OF LABOUR FORCE BY OCCUPATION DIVISION, NEWFOUNDLAND, 1945-61, AND NET CHANGES OVER THE PERIOD

Occupations	Numerical Distribution			Net Change in Number			% Distribution			Net Change in % Distribution		
	1945	1951	1961	1945-51	1951-61	1945-61	1945	1951	1961	1945-51	1951-61	1945-61
All Occupations	112508	106540*	122423	-5968	15883	9915	100.0	100.0	100.0	00	00	
White Collar	17542	24809	35140	7267	10331	17598	15.7	23.2	28.6	7.5	5.4	12.9
(1) Managerial	4124	6829	8703	2705	1874	4579	3.7	6.4	7.1	2.7	0.7	3.4
(2) Professional and technical	4706	5468	9478	762	4010	4772	4.2	5.1	7.7	0.9	2.6	3.5
(3) Clerical	4931	6837	9823	1906	2986	4892	4.4	6.4	8.0	2.0	1.6	3.6
(4) Sales	3781	5675	7136	1894	1461	3355	3.4	5.3	5.8	1.9	0.5	2.4
Blue Collar	25634	28804	33282	3170	4478	7648	22.8	27.0	27.2	4.2	0.2	4.4
(1) Craftsmen, production process etc.	16956	20225	25617	3269	5362	8661	15.1	19.0	20.9	3.9	1.9	5.8
(2) Labourers	8678	8549	7665	-129	-884	-1013	7.7	8.0	6.3	0.3	-1.7	-1.4
Transportation and Communication	6240	8302	9020	2062	718	2780	5.5	7.8	7.4	2.3	-0.4	1.9
Service and Recreation	13818	10470*	13212	-3348	2742	-606	12.3	9.8	10.8	-2.5	1.0	-1.5
Primary Occupations	44684	33474	28411	-11210	-5063	-16273	39.9	31.5	23.2	-8.4	-8.3	-16.7
(1) Farmers and Farm Workers	4221	3682	1694	-539	-1988	-2527	3.7	3.5	1.4	-0.2	-2.5	-2.3
(2) Loggers, etc.	7264	9153	5748	1889	-3405	-1516	6.7	8.6	4.7	1.9	-3.9	-2.0
(3) Fishing, trapping etc.	31198	18383	18756	-12815	373	-12442	27.7	17.3	15.3	-10.4	-2.0	-12.4
(4) Mining, quarrymen etc.	2001	2256	2213	255	-43	212	1.8	2.1	1.8	-0.3	-0.3	0.0
Unspecified	4590	1086	3399	-3504	2313	-1191	4.0	1.0	2.7	-3.0	1.7	-1.3

Sources: Census of Newfoundland and Labrador, 1945, Table 1; Census of Canada, 1951, Vol. IV, Table 4; Census of Canada, 1961: (94-551), Table 8.

* A reduction in the total labour force between 1945 and 1951 is due to a cut in the armed forces and a decline in the number of maids and other household workers, although one is not sure as to why the latter group declined.

say, therefore, that the steep fall of the primary share of the labour force after 1945 reflects the combined effects of the relative and absolute decline of these occupations, and more particularly of fishing.

The reasons for the relative and absolute decline of the primary occupations in general and the fishing group in particular are well known and need not be detailed here. The major factors responsible for the decline in fishing occupations have been the low income-elasticity of demand for fish products, unstable export markets due to severe competition, low level of income in fishing in relation to other activities, expanding job opportunities off the fishing industry and out-moded methods of fishing.[1] The decline in the relative as well as absolute size in the logging occupations was caused by mechanization and rationalization of pulp and paper mills and logging operations.[2] Farmers and farm workers as a group have shown a relative as well as absolute decline in size mainly as a result of the gradual abandonment of supplementary subsistence farming in the wake of the increasing opportunities of employment in other fields, cheapened food imports from Canada since confederation and, to a certain extent, by commercialization of agriculture.[3] While mining operations expanded during the post-war years in the province, the absolute size of the labour force has remained almost stable mainly due to the fact that modern mining operations employ much expensive equipment, but rather few men in relation to the value of their output.[4]

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1. Parzival Copes: St. John's and Newfoundland - An Economic Survey, (St. John's), 1961, pp. 88-90.
2. Report of the Royal Commission on the Economic State and Prospects of Newfoundland and Labrador, (St. John's), 1967, pp. 158, 163.
3. P. Copes: op. cit., p. 99.
4. Ibid., p. 85.

As against this trend in the primary occupations, there has been a spectacular rise in the labour force share of white collar workers during this period. Over the period 1945-61, white collar occupations increased faster, both absolutely and relatively, than any other major occupational group. In absolute terms the increase amounted to 17.5 thousand, an increase of 100 percent, as compared with barely 9 percent increase in the civilian labour force of the province during the same period; in relative terms, this group rose by 13 percent, the largest relative rise in the total labour force. The rate of growth was, however, significantly faster during 1945-51 than that in the succeeding decade. As a result of this fast rate of growth, the white collar occupation's share of the labour force in Newfoundland increased from only 1.5 persons out of every ten workers in the work force in 1945 to three out of every ten workers in 1961.

Within the major division of white collar occupations, there was a good deal of similarity in the growth pattern of the component groups. It is evident from Table II-1 that managerial occupations experienced the fastest rate of growth, followed by professional, technical, clerical and sales occupations. The increase of managerial occupations, which includes owners, managers and business executive officials, involved a doubling in its size between 1945-1961, mainly as a result of expansion in activities like trade and finance in which managerial occupations form a major proportion of their work force and, secondly, due to general shift in the occupational structures of all the industries in favour of managerial and other white collar occupations, (see Table I-2).

Professional and technical occupations experienced the second highest growth rate over this period. By 1961, this group was almost twice

its size in 1945, having added about 4,772 persons to the labour force. It increased its share of the total work force from 4.2 percent in 1945 to 7.7 percent in 1961, which reflects technological changes in industries which increasingly require the services of technically and scientifically trained personnel in production, distribution and research. It also reflects expansion of government and community services requiring professional workers.

An equally significant growth, both absolutely and relatively, was experienced by the clerical occupations; while this group increased by 99 percent in absolute size, its relative share in the total labour force rose from 4.4 percent in 1945 to 8.0 percent in 1961, mainly as a result of expansion of record-keeping activities, office equipment and communications to meet the complex requirements of modern business organization. Sales occupations also recorded substantial increase, both in absolute and relative terms, as a result of expansion in trade activities during the period (Table I-1).

Blue-collar occupational group includes manual workers, outside of agriculture, fishing, logging and mining occupations, and it increased at less than one-third the rate of white collar occupations over the period under consideration. It added approximately 7.6 thousand workers to the labour force between 1945 and 1961, i.e., 29.8 percent, most of this increase taking place in 1945-51. One has, of course, to take note of the fact that this increase might be partly spurious due to the large unspecified category in 1945. The overall increase in the blue-collar category, as evident from Table II-1, was due to greater employment of craftsmen in the production process, while the number of unskilled labourers decreased by 11.6 percent during 1945-61. While the growth

of craftsmen, production process and related workers indicates the expanding requirements for mechanics and repairmen of all kinds, to install, maintain and service the growing complex of new and improved machinery and equipment being used in factories, office, stores and in the home, the declining proportion of the unskilled labourers reflects the increasing substitution of machines for the human muscle power required in heavy work.

Transportation and communication occupations recorded an increase of more than 44 percent during 1945-61, due to developments in road transport and communications during the last two decades. Service and recreation occupations, on the other hand, declined both in absolute and relative terms, mainly due to a fall in this group during 1945-51, while it increased in size, both in number as well as in relative share, during 1951-61. This fall in the service occupations was caused by a cut in armed forces and a decline in maids and other household workers (see Appendix A).

Broad conclusions that emerge from the foregoing analysis and their economic implications are obvious. Over the period 1945-61, there has been a spectacular shift in the labour force in favour of white collar occupations against primary occupations, while blue collar and transportation and communications occupations have shown moderate relative upward shifts; service and recreation occupations also have recorded an upward relative change during 1951-61, although over the period 1945-61, this group has exhibited a fall in its proportion due to certain special factors mentioned earlier. If we assume that these occupational trends have continued during the sixties in the provincial economy as a consequence of the continuation of the same growth trends and technological advances as in the forties and the fifties, it is obvious that relatively more people must have been absorbed in the economy to administer and coordinate

the production of goods, to provide maintenance services and to participate in financing, insurance and distributing aspects of business operations. A further mechanization of production process must have increased the requirements for the white-collar occupations such as office, administrative, managerial, engineering, scientific and technical personnel, whereas requirements for unskilled labourers must have declined further as a consequence of substitution of machines and mechanics for unskilled muscle power. The requirements for transportation and communication workers as well as service and recreation workers could also be assumed to have increased during the sixties as the provincial economy has reached higher levels of development. On the other hand primary occupations must have recorded further decline both in absolute and relative terms due to fluctuating demand as well as technological advances. The projection of these trends in various occupations will be taken up in Chapter IV.

A COMPARATIVE STUDY OF OCCUPATIONAL CHANGES: NEWFOUNDLAND, NOVA SCOTIA AND CANADA

While the previous section focussed attention on the occupational trends in the Newfoundland labour force over the period 1945-61, an attempt will be made in the following pages to compare the occupational patterns, occupational shifts and their rates of change over the period 1941-1961, between the Newfoundland labour force, on the one hand, and those of Canada and Nova Scotia, on the other, with a view to bringing out their economic implications. Comparison with the Nova Scotian labour force is brought in, because both Newfoundland and Nova Scotia belong to the same geographical region and that both are considered to be relatively backward as compared with most of the provinces of the Mainland. Three

things stand out most significantly from a comparative analysis, as we will see at the end of this section. First, the labour force of Newfoundland, in terms of occupational composition, lags behind the Canadian labour force and that of Nova Scotia by more than a decade or so; secondly, the fundamental economic forces at work in Newfoundland and Canada, as a whole, are one and the same, although Newfoundland lags behind Canada, in terms of the degree of industrialization; thirdly the rate of change in the occupational composition of the Newfoundland labour force is much faster than those of the Canadian and Nova Scotia labour forces, reflecting the faster rate of economic change in the province in recent years. Comparative study will be made from three angles, namely (1) an analysis of occupational patterns at any given point of time; (2) a study of the direction of relative shifts in the occupational groups over the period 1941-61; and (3) a comparative study of the rates of change in the occupational groups.

Table II-2 presents the percentage distribution of the labour forces, by occupation division, of Newfoundland for 1945-1961, Canada and Nova Scotia for 1941-1961. First, if we compare the occupational composition of the Newfoundland labour force of 1945, with those of the Canadian and Nova Scotian labour force of 1941, it becomes clear that while the overall occupational patterns in all the three cases were similar, there were differences between the three labour forces, in terms of the ratio of skilled to unskilled workers. While the 1945 data for Newfoundland and the 1941 data for Canada and Nova Scotia are for different years, a comparison might still be useful in revealing, in a broad way, the differences in occupational structures, levels of skill and labour efficiency between the areas under consideration. The overall

occupational patterns of the Newfoundland, Canadian and Nova Scotia labour forces were similar in this period with primary occupations representing a large proportion of the respective labour force in each case, followed by blue collar and white collar categories in that order. In Newfoundland, nearly 40 percent of the work force was represented by primary occupations followed by blue collar (22.8 percent) and white collar groups (15.7 percent). The Canadian and Nova Scotia labour forces exhibited the same structure in 1941. While there were no structural differences between the occupational compositions, the ratio of skilled workers in Newfoundland in 1945 was about 1.5 persons out of every ten workers; the comparable ratios for Canada and Nova Scotia were 2.5 persons and 2 persons respectively. If we had compared the 1941 data for Newfoundland, the differences would have been definitely much more than these ratios would suggest. On the other hand, the ratio of unskilled workers in Newfoundland was about 4.8 persons out of every ten workers, those for Canada and Nova Scotia were 3.6 persons and 4.3 persons respectively. Therefore, one could conclude that while the overall occupational patterns were similar in 1941 between Newfoundland, on the one hand, and Canada and Nova Scotia, on the other, the proportion of managerial, professional, clerical and sales workers in Newfoundland was below those of Canada and Nova Scotia. However, a comparison of the 1951 occupational compositions reveals certain fundamental differences between the Newfoundland labour force, on the one hand, and Canadian and Nova Scotian labour forces, on the other. The labour force of Newfoundland in 1951 exhibited the same occupational pattern of 1945 in spite of the shifts in favour of white collar and blue collar workers: primary occupations still represented the major proportion of the labour force (31.5 percent), followed by blue

PERCENTAGE DISTRIBUTION OF THE LABOUR FORCES, BY OCCUPATION DIVISION, NEWFOUNDLAND (1945-1961), CANADA AND NOVA SCOTIA (1941-1961)

Occupations	NEWFOUNDLAND			CANADA			NOVA SCOTIA		
	1945	1951	1961	1941	1951	1961	1941	1951	1961
All occupations	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White Collar	15.7	23.2	28.6	25.3	32.0	37.9	21.0	28.2	35.8
(1) Managerial	3.7	6.4	7.1	5.4	7.4	7.8	5.1	7.4	8.3
(2) Professional and technical	4.2	5.1	7.7	6.7	7.3	9.8	5.8	6.8	9.8
(3) Clerical	4.4	6.4	8.0	7.2	10.7	12.7	5.5	8.6	11.0
(4) Sales	3.4	5.3	5.8	6.0	6.6	7.6	4.6	5.4	6.7
Blue Collar	22.8	27.0	27.2	27.1	29.4	26.6	25.7	29.2	29.0
(1) Craftsmen, production process, etc.	15.1	19.0	20.9	20.8	22.7	21.3	18.4	21.1	22.2
(2) Labourers	7.7	8.0	6.3	6.3	6.6	5.3	7.3	8.1	6.8
Transportation and Communication	5.5	7.8	7.4	6.4	7.8	7.7	6.2	7.8	7.4
Service and Recreation	12.3	9.8	10.8	10.5	9.8	12.4	11.5	9.4	11.5
Primary Occupations	39.9	31.5	23.2	30.5	19.8	12.8	35.4	23.9	14.1
(1) Farmers, etc.	3.7	3.5	1.4	25.7	15.7	10.0	19.6	11.1	5.7
(2) Loggers, etc.	6.7	8.6	4.7	1.9	1.9	1.2	2.8	2.4	1.6
(3) Fishing, etc.	27.7	17.3	15.3	1.2	1.0	0.6	5.6	4.8	3.5
(4) Miners, etc.	1.8	2.1	1.8	1.7	1.2	1.0	7.4	5.6	3.3

Sources: Census of Newfoundland and Labrador, 1945, Table 1; Census of Canada, 1941, Vol. VII, Table 4; Census of Canada, 1951, Vol. IV, Table 4; Census of Canada, 1961: (94-551), Table 8.

collar (27.0 percent) and white collar workers (23.2 percent). On the other hand Canadian and Nova Scotian labour forces in 1951, while gaining further in the proportions of blue collar and white collar workers, exhibited fundamental structural changes in their occupational compositions as compared to the 1941 occupational patterns. While the occupational patterns in 1941 of both Canadian and the Nova Scotian labour forces were characterized by the predominance of primary occupations, followed by blue collar and white collar workers, the 1951 occupational structures in both the cases exhibited the reverse pattern. White collar workers represented the major share of the labour force followed by blue collar and primary occupations, reflecting the rapid economic changes the Canadian economy underwent during the forties under the impact of the World War II. Thus in 1951, while the provincial labour force was still dominated by unskilled workers, the Canadian and the Nova Scotian labour forces were characterized by the predominance of skilled workers. In 1961, while the occupational structures of the Canadian and Nova Scotian labour forces continued to be the same as in 1951, with further gains in the proportion of white collar workers at the cost of primary occupations, the occupational pattern of Newfoundland labour force exhibited the same fundamental change in its occupational composition as those of the Canadian and the Nova Scotian labour forces in 1951: white collar workers representing 28.6 percent of the labour force, followed by blue collar workers (27.2 percent) with primary occupations declining to the third place in its relative share. This means that the occupational composition of the Newfoundland labour force underwent during the 1950's the same critical structural changes which the occupational compositions of the Canadian and Nova Scotian labour forces experienced during the 1940's.

If this is any guide, one could say that the labour force of Newfoundland in 1961, in terms of occupational composition, was behind the Canadian and Nova Scotian labour forces, by about a decade. What is really striking, as Table II-2 reveals, is the very close resemblance of the occupational composition of the Newfoundland labour force in 1961 to that of the Nova Scotian labour force in 1951: white collar workers formed about 28 percent of the labour force in both the cases and primary occupations represented about 23 percent of the labour force in both the cases, while the blue collar category in both the cases showed negligible differences in their proportions: while this group accounted for 27.2 percent in Newfoundland, Nova Scotian labour force had about 29 percent in this category. As revealed in graph 1, while the critical changes in the occupational structures occurred in the early forties in Canada as a whole and during the late forties in Nova Scotia, they came about in Newfoundland in the late fifties, putting the Newfoundland labour force behind the Nova Scotian and the Canadian labour forces.

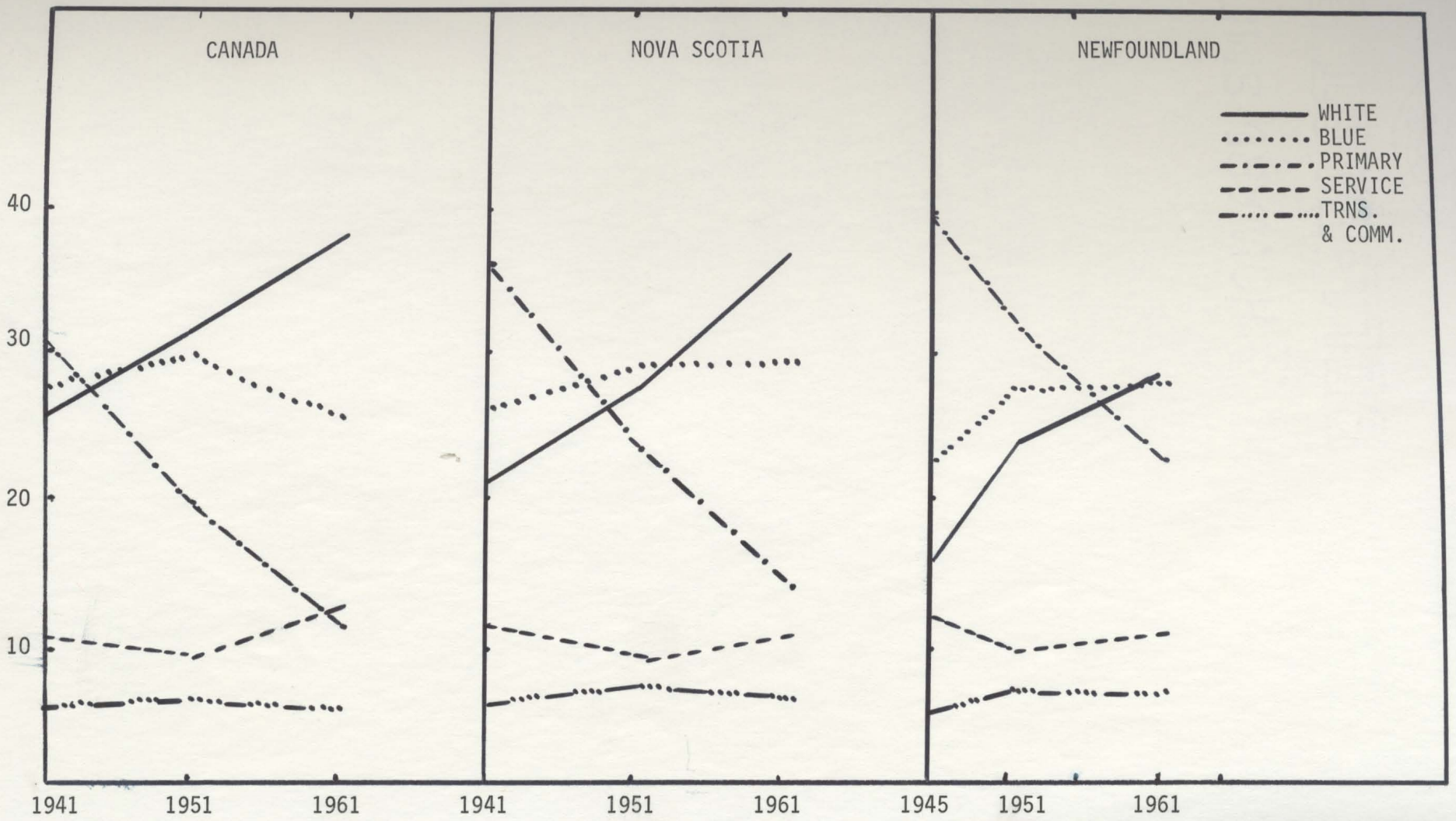
Although there are differences in the levels of skill and labour efficiency, measured in terms of occupational compositions, between Newfoundland, on the one hand, and Canada and Nova Scotia, on the other, the underlying basic economic forces governing the occupational compositions in Newfoundland, Nova Scotia and Canada as a whole appear to be the same. This could be demonstrated by comparing the direction of occupational shifts in all the three cases during 1941-1961. As Table II-2 demonstrates clearly, the major occupational groups in Newfoundland, Nova Scotia and Canada shifted in the same direction during this period. White collar category in all the cases gained significantly in its relative size, jumping from third place to first place, whereas primary occupations lost

their relative position from the first place to third place in all the three cases in this period. The blue collar category in the case of Newfoundland and Nova Scotia shifted upward slightly, whereas this group barely maintained its relative position in the Canadian labour force. The direction of change in respect to Transportation and Communication workers was the same in the three cases. Service and recreation occupations, however, showed slight differences in their behaviour pattern. While they declined slightly in their relative size in the case of Newfoundland, they maintained their share in the case of Nova Scotia, whereas their share in the Canadian labour force slightly increased over this period. This fall in the share of this group in Newfoundland was due to a special factor, namely, the withdrawal of large numbers of armed forces from Newfoundland, with the cessation of the World War II. The similarity in the behaviour patterns of these occupational groups seems to demonstrate that the labour force in Newfoundland is subject to the influence of the same technological and economic forces underlying the Canadian economy as a whole, by virtue of geographical proximity, political and economic integration and socio-cultural unity.

Another level of comparison which makes interesting reading is that of the rates of change in different occupations during the period under consideration. As Table II-3 demonstrates, all the white collar occupations, craftsmen, production process and related workers, and transportation and communication workers changed at a much faster rate in Newfoundland than either in Canada as a whole or in Nova Scotia; similarly, the primary workers in Newfoundland declined at a much faster rate than the same group in Canada and Nova Scotia. This, perhaps, reflects, among other things, a fast rate of economic change that the

Graph 1

PERCENTAGE DISTRIBUTION OF LABOUR FORCE BY OCCUPATION DIVISIONS, CANADA, NOVA SCOTIA AND NEWFOUNDLAND: 1945, 1951 AND 1961 FOR NEWFOUNDLAND, AND 1941, 1951 AND 1961 FOR NOVA SCOTIA AND CANADA



Provincial economy has been experiencing during the last two decades, especially since Confederation.

Table II-3

ANNUAL RATES OF CHANGE IN THE OCCUPATIONAL GROUPS,
IN NEWFOUNDLAND BETWEEN 1945-1961, AND
IN CANADA AND NOVA SCOTIA BETWEEN 1941-1961
(in percentage points)

	NEWFOUNDLAND %	NOVA SCOTIA %	CANADA %
Managerial	0.20	0.16	0.12
Professional and technical	0.23	0.20	0.15
Clerical	0.42	0.27	0.27
Sales	0.28	0.11	0.08
Production process and related workers	0.67	0.19	0.025
Labourers	-0.05	-0.02	-0.05
Transportation and Communication	0.20	0.06	0.055
Service and Recreation	-0.14	--	0.095
Farmers, etc.	-0.31	-0.70	-0.78
Logging, etc.	-0.28	-0.06	-0.035
Fishing, etc.	-1.40	-0.11	-0.03
Mining, etc.	--	-0.21	-0.035

Source: Table II-2.

CHAPTER III

SHIFTS IN DEMAND AND SUPPLY CURVES FOR LABOUR BY OCCUPATION

In the previous chapter, an attempt was made to analyze trends in the occupational composition of the labour force in Newfoundland in comparison with the Canadian and Nova Scotian labour forces. The objective of this chapter is to determine whether shifts in demand or supply curves of labour were primarily responsible for changes in the occupational composition of the labour force between 1945 and 1961. This chapter consists of two sections. The first section presents the model on which the demand-supply analysis is based. In the second section, the analysis is carried out using changes in relative earnings in each year and changes in the occupational composition of the labour force. Finally, some of the limitations of the supply-demand analysis are indicated.

The tool of analysis which will be used to identify whether shifts in demand schedules or shifts in supply schedules had the greatest impact on an occupation's proportion of the labour force, is the simple demand and supply model, developed by Noah M. Meltz in his "Changes in the Occupational Composition of the Canadian Labour Force, 1931-1961".[1] The basic assumptions of the model are that there is a national market for each occupation in which price (relative earnings) and quantity (proportion of the labour force in the occupation) are simultaneously determined and, secondly, that the demand and supply curves have their normal shapes, i.e.

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1. Noah M. Meltz: Changes in the Occupational Composition of the Canadian Labour Force, 1931-1961, Economics and Research Branch, Department of Labour, Canada, March, 1965, pp. 35-39.

the demand curve slopes downward to the right and the supply curve slopes upward to the right; although, the exact slope of each curve for each occupation is not known, Meltz argues that neither curve is horizontal or vertical.[1] Given these assumptions, Figure 1 shows a typical pair of demand and supply curves D_1D_1 and S_1S_1.

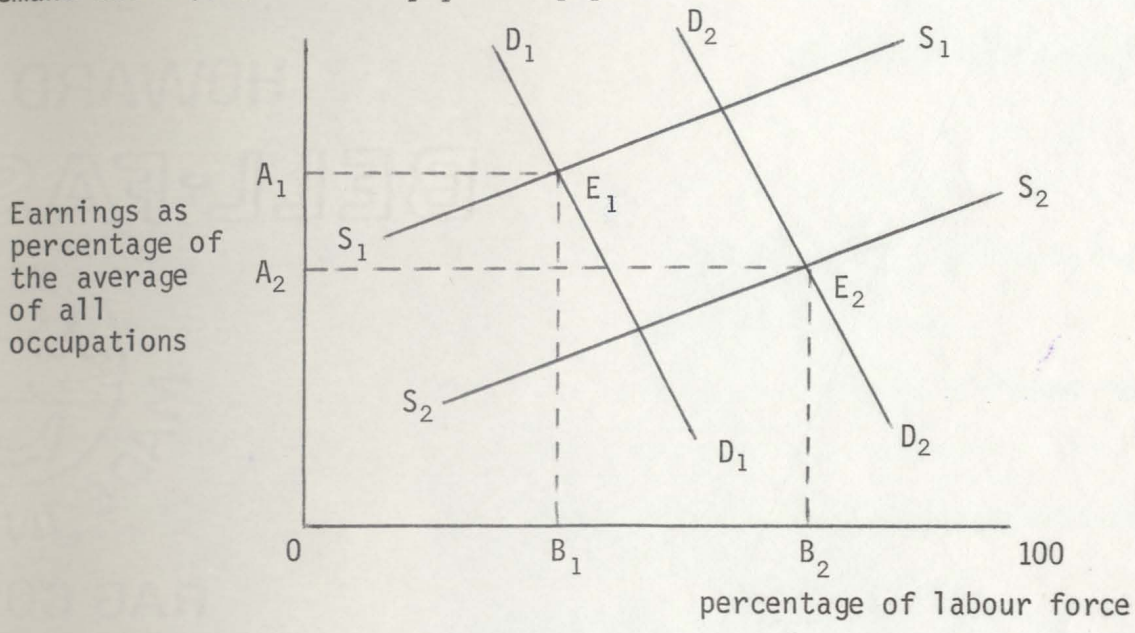

Figure 1.

The point of intersection is E_1 with the equilibrium relative earnings OA_1 and the equilibrium proportion of the labour force OB_1. Now, if we assume that the demand curve and the supply curve shift to the right, a new equilibrium position is established at E_2, where the new demand curve D_2D_2 intersects the new supply curve S_2S_2. The change in the relative earnings of the occupation and the proportion of the labour force in the occupation are determined by the amount of shift in each curve and by the slopes of the curves. In this case, relative earnings fell from OA_1 to OA_2 and the occupation's proportion of the labour force rose from OB_1 to OB_2.

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1. Ibid., p. 36.

It is important here to note that the movement from E_1 to E_2 resulted from an increase in supply (a rightward shift in the supply curve) which exceeded the increase in demand (a rightward shift in the demand curve). However, the same combination of a decrease in relative earnings and an increase in the proportion of the labour force would also be consistent with four other possible combinations of shifts in demand and supply curves:

(1) An increase in supply with no change in demand.

(2) An increase in supply with smaller decrease in demand (where the demand curve is flatter than the supply curve).

(3) An increase in supply with an equal decrease in demand (where the demand curve is flatter than the supply curve).

(4) An increase in supply and a larger decrease in demand (where demand curve is sufficiently flatter than the supply curve).

From this it can be seen that the movement from one equilibrium position to another depends on: the direction of the shifts in the demand and supply curves; the amount of the shifts in the curves; and the slopes of the curves. But there is no way of precisely measuring these factors. However, one can use the changes in relative earnings and proportion of the labour force in an occupation to determine whether a shift in the demand or supply curve was dominant and in which direction the shift took place. We saw earlier that the combination of a decrease in relative earnings in an occupation and an increase in the percentage of the labour force in an occupation would result from an increase in supply and five possible changes in demand. In this situation, where the final equilibrium position is in the lower right quadrant, using E_1 as the origin, in Figure 2, it can be said that the increase in supply was the dominant

factor. Similarly, it is possible to indicate the dominant factor in the case of the other three quadrants as is shown in Figure 2.

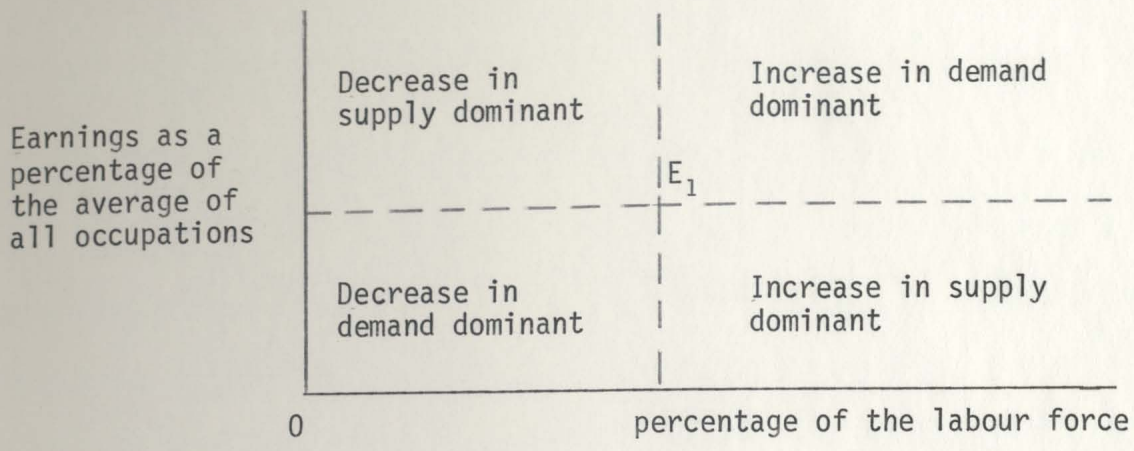

Figure 2.

When the final equilibrium position is situated on one of the boundary lines this means that the shifts in the demand and supply curves have offset each other with neither factor being dominant. If there is no change in relative earnings and an increase in the proportion of the labour force, then both demand and supply have increased to the same extent. Conversely, if relative earnings are unchanged and the proportion of the labour force falls, then demand and supply have both decreased to the same extent. If there is an increase in relative earnings, then demand has increased but supply decreased to the same extent. The final possibility is a decrease in relative earnings with no change in the proportion of the labour force, which means that demand decreased and supply increased by the same amount. These are the four combinations which would leave one of the factors unchanged.

This model uses the changes in relative earnings in an occupation and the changes in the occupation's proportion of the labour force to determine: (1) whether a shift in the demand curve for persons to perform

an occupation was the dominant factor; or whether the dominant factor was a shift in the supply curve; and (2) the direction of the dominant shift.

IMPACT ON OCCUPATIONAL COMPOSITION OF SHIFTS IN SUPPLY AND DEMAND CURVES, 1945-1961

The demand-supply analysis requires a knowledge of both relative earnings and occupational composition. Movements in the latter variable over the period 1945-61 were described in Chapter II, but relative earnings have not been introduced. Accordingly, the first part of this section deals with the earnings data. Following this, the analysis of the occupational impact of shifts in demand and supply schedules will be undertaken.

The term "relative earnings in an occupation" is defined in this study as the percentage figure derived by dividing average earnings in an occupation by the average earnings for all occupations. The average earnings data are based on the income wage and salary earners reported for the twelve months preceding each census date. Wage and salary earners are one of four classes of workers identified in each census. The other three classes of workers are: employers; own account; and no pay, (unpaid family worker). Table III-1 below shows the number of wage earners reporting income as a percentage of the labour force in each occupation. In only three cases was the wage earner figure in 1961 below 80 percent; managerial (48), agriculture (39) and fishing (10). Since it is not possible to estimate the incomes of all the other classes of workers in each occupation, it is assumed that the average income of all persons in each occupation group followed the same pattern of change as the income of the wage earner's portion.

Table III-1

PERCENTAGE OF NEWFOUNDLAND LABOUR FORCE IN EACH OCCUPATION REPORTING EARNINGS, AS OF OCT. 1, 1945, JUNE 1, 1951 AND JUNE 1, 1961

	1945	1951	1961
All occupations	78.0	73.9	78.2
Managerial	49.2	39.8	48.6
Professional and technical	61.2	95.8	95.9
Clerical	78.3	99.7	99.3
Sales	93.2	78.4	89.9
Craftsmen, production process, etc.	77.7	94.0	95.3
Labourers	88.0	99.5	99.0
Transportation and Communication	70.9	92.0	91.8
Service and Recreation	67.0	94.6	93.7
Agriculture	72.0	21.7	39.3
Logging	90.6	93.4	95.2
Fishing	10.3	7.2	10.6
Mining	85.6	100.0	99.8

Source: Census of Newfoundland and Labrador, 1945, Table 47; Census, 1951, Vol. IV, Table 11, Vol. V, Table 21; Census, 1961, (94-539).

A more desirable measure of earnings in each occupation than what is done here would be income per hour. This could be calculated by dividing average earnings in each year by the number of hours worked in the year. Since it is likely that the number of hours worked in each occupation in a year have changed by different amounts over time, there undoubtedly will be a difference between the changes in relative earnings measured by yearly income and earnings measured by income per hour. Unfortunately, the census does not record hours of work and therefore it is not possible to prepare independent estimates.

Table III-2 shows the average earnings per year in each occupation along with relative earnings. There are three changes in the earnings indexes which stand out. While the absolute earnings in all the occupations have increased during 1945-61, the relative earnings have exhibited three trends during this period.

(1) The relative earnings of four occupations, namely, professional and technical, farmers and farm workers, loggers and related workers and miners, quarrymen, etcetera rose between 1951 and 1961 after declining between 1945 and 1951.

(2) In the case of seven occupations such as managerial, clerical, sales, transportation and communication, fishermen, craftsmen, production process and labourers, the relative earnings declined continuously from 1945.

(3) Service and recreation occupations experienced a rise in relative earnings between 1945 and 1951 and then fell between 1951 and 1961.

These data on relative earnings together with the occupational data presented in Chapter II are juxtaposed in Table III-3 to determine whether

Table III-2

WAGE EARNERS BY OCCUPATION GROUPS SHOWING AVERAGE EARNINGS DURING THE TWELVE MONTHS PRIOR TO EACH CENSUS: 1945, 1951 AND 1961

	Average annual earnings (current dollars)			Earnings in each occupation as a percentage of total average		
	1945	1951	1961	1945	1951	1961
All occupations	841	1422	2522	100.0	100.0	100.0
Managerial	1887	3100	4849	224.0	218.0	192.0
Professional	1142	1630	2979	135.0	115.0	118.0
Clerical	1113	1650	2653	132.0	116.0	105.0
Sales	793	1137	1841	94.0	80.0	73.0
Craftsmen etc.	1255	1758	2819	149.0	124.0	112.0
Labourers	723	1023	1625	86.0	72.0	64.0
Transportation and Communication	1120	1594	2727	133.0	112.0	108.0
Service and Recreation	566	970	1926	67.0	68.0	76.0
Farmers etc.	633	833	1530	75.0	59.0	61.0
Logging etc.	691	866	1591	82.0	61.0	63.0
Fishing etc.	553	754	1079	66.0	53.0	53.0
Mining etc.	1143	1831	3555	136.0	129.0	141.0
Not stated	770	983	2593	96.0	69.0	103.0

Source: Census of Newfoundland and Labrador 1945, Table 47; Census, 1951, Vol. V, Table 21; Census, 1961 (94-539).

a shift in the demand curve for an occupation or a shift in the supply curve was the dominant factor over a particular period of time. Where the shift in the demand curve was the dominant change the letter 'D' is inserted in the proper section. The letter 'S' indicates that the supply curve was dominant. When the dominant change involved a shift to the right (an increase), no sign is attached to the letter. A negative sign indicates a shift to the left (a decrease). Where neither the shift in the demand curve nor the shift in the supply curve was dominant, the letter 'E' is entered. Those cases where there was only a change of 0.1 in percentage distribution or 1 in the earnings index are also included in the category of shifts designated by an "E".

Over the period 1945-1961, shifts in supply curves appear to have been dominant for most occupations. Increases in supply dominated changes in all the white collar occupations, craftsmen, production process and related workers, and transportation and communication occupations, while decreases in supply dominated the changes among service and recreation occupations. An increase in demand was the most important factor for the changes in miners, quarrymen and related workers, while the changes in logging, fishing and agricultural occupations were dominated by decreases in demand. The most interesting developments were the periodical changes in each occupation:

(1) Between 1951 and 1961 increases in demand had the greatest impact on professional and technical occupations. In the previous decade (1945-51), supply changes had been dominant.

(2) Increases in supply dominated, both in 1945-51 and 1951-61, the rapid and continued increase in the proportion of the labour force in managerial, clerical and sales occupations among the white collar category,

DEMAND AND SUPPLY CHANGES BY OCCUPATION GROUP:
1945, 1951 AND 1961, NEWFOUNDLAND

	Earnings in each occupation as a percentage of total average earnings (current dollars)			Percentage Distribution of the labour force			Factor which changed most in each period.(1)		
	1945	1951	1961	1945	1951	1961	1945-61	1945-51	1951-61
All occupations	100	100	100	100.0	100.0	100.0			
Managerial	224	218	192	3.7	6.4	7.8	S	S	S
Professional	136	115	118	4.2	5.1	8.3	S	S	D
Clerical	132	116	105	4.4	6.3	8.8	S	S	S
Sales	94	80	73	3.4	5.0	6.2	S	S	S
Craftsmen etc.	149	124	112	15.1	19.0	20.9	S	S	S
Labourers	86	72	64	7.7	8.0	6.3	-D	S	-D
Transportation and Communication	133	112	108	5.6	10.1	8.1	S	S	-D
Service and Rec.	67	68	76	12.3	9.9	11.7	-S	E	D
Farmers etc.	75	59	61	3.8	3.3	1.4	-D	-D	-S
Loggers etc.	82	61	63	6.5	8.6	5.1	-D	S	-S
Fishermen etc.	66	53	43	27.7	17.3	15.3	-D	-D	-D
Miners etc.	136	129	141	1.8	2.1	2.0	D	S	E

Source: Table II-1 (page 22) and Table III-2 (page 43).

(1) S: Change in supply dominant; D: Change in demand is the dominant factor;
E: Demand and supply changed by the same amount. Minus sign indicates a decline.

and craftsmen, production process and related workers among the blue collar occupations.

(3) Supply changes were dominant behind increases in the proportion of manual labourers and also transportation and communication workers during 1945-1951, whereas, during the next decade, reduction in demand was the most important factor in determining the proportion of both the categories of workers in the total labour force.

(4) In the case of service and recreation occupations, both demand and supply factors were neutral during 1945-51. Between 1951-1961, increases in demand dominated the rapid increase in the proportion of this category of workers among the total labour force.

(5) During 1945-51, when agricultural workers suffered a decline in the proportion of the total labour force, decrease in demand for agricultural workers was the most important factor, whereas a decrease in the supply was the most dominant element in the next decade.

(6) In the case of loggers and related workers, increases in supply dominated the increase in their proportion of the total labour force during 1945-1951. A decline in the supply of these workers was the most dominant factor behind a decrease in their proportion between 1951 and 1961.

(7) Decreases in demand dominated the rapid and continued decline in the absolute and relative proportion of fishermen and related workers since 1945.

(8) While the supply factor dominated the increase in the proportion of miners and related workers during 1945-51, increases in supply and demand for this category of workers were approximately equal during the succeeding decade.

One has to note, however, certain limitations of this supply and emand analysis. First, a fact that emerges from Table III-2 is that ile the earnings of nearly all occupational groups have fallen as a rcentage of the average earnings of all occupations between 1945 and 961, the earnings of some occupations such as Service and Recreations, d Mining etc., and "Not stated" have actually risen in relation to the rnings in other occupations in the same period. This perhaps is the sult of the fact that the average earnings for all occupations was tained by dividing total earnings by total numbers employed. The con-quence is that in the system of explaining changes by supply-demand alysis, between 1945 and 1961 and in each of the two sub-periods, arly all the observations fall into the two boxes of Figure 2 in which rnings as a percentage of all occupations have fallen. Changes in the mposition of occupation, therefore, have been explained by an increase the supply or by a decrease in demand. This seems to be the reason to why an increase in demand has not entered the picture more frequently. the other hand, if we had used as an average of earnings in all occu-tions a weighted sum of the average earnings in each occupation, the sults would have been slightly different, and perhaps, increase in mand would have been an important factor in influencing the changes in cupational composition.

Secondly, the results of the demand and supply analysis reflect t only the secular trends but also cyclical changes, because cyclical uctuations produce their impact both on relative earnings and the occu-tional composition of the labour force. For example, average earnings the twelve months preceding each census data are used in the demand-pply analysis in the preceding section. The figures are based on the

ncome reported by wage and salary earners regardless of the amount of ime they were employed in these twelve months. Undoubtedly, an increase n unemployment would lower the average earnings in an occupation while a eduction in unemployment would raise the average. Secondly, cyclical hanges do affect the occupational composition of the labour force. One ould, of course, assume that the effect of cyclical changes is to raise r lower the number of persons in each occupation who are unemployed but hat the total labour force and the labour force in each occupation re- ains unchanged, if we defined labour force in each occupation as the umber of employed persons in the occupation plus the number of unemployed n that occupation. However, if the unemployed tend to leave the labour orce, then the occupational composition would be altered. Therefore one as to bear in mind these limitations of the supply and demand analysis resented in this chapter.

CHAPTER IV

OCCUPATIONAL COMPOSITION: A PROJECTION

Once the changing patterns of occupational composition of the past have been analyzed, the next step is to focus attention on the pattern of occupational composition in 1971. An attempt is made in this chapter to project the occupational composition of the Newfoundland labour force for the year 1971. As we know, the occupational composition reflects the changing industrial structure of the economy and changing technology. The industrial structure will, in turn, be affected by the rate of economic growth, changes in consumption and investment patterns as well as by the nature and extent of public expenditure. Both the limitations of the data used and the inadequate forecasting techniques, make the projection of occupational structure somewhat hazardous. However, following Professor S. Judek[1], an examination of the past trends in the occupational composition and reasonable assumptions as to the continuation of some of these trends make it possible to envisage the projected distribution of the civilian labour, by major occupational group, for the province in 1971. It is necessary to make an integrated forecast for all major occupational categories within the framework of the expected total supply of labour force in the terminal year. The projected totals of male and female labour force in 1971 are allocated in absolute figures according to the projected percentage distribution by occupational groups.

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1. Professor S. Judek: Manpower Training Requirements of Nova Scotia, 1970 and 1975, Economics and Research Division, Department of Labour, (Halifax), Nova Scotia, 1968.

However, before going into the analysis of projections, it is necessary to make some observations regarding the method of projection followed here. Ideally, of course, one should, first, project the expected employment in 1971 for all the major ten industry groups, and then to proceed to find what this meant for the occupational groups, taking into account not only the relative industry shifts in employment, but also the occupational shifts within industries. However, the projections in this study are made directly on the basis of the way in which the numbers in the various occupational groups have changed between 1945 and 1961. The basic assumption is that the past trends in the provincial occupational groups have continued in the sixties.

The white collar occupational group is assumed to have increased its share of the total labour force, both in absolute and relative terms. Again managerial and professional categories were the fastest growing occupations during 1945-61, followed by clerical and sales occupations respectively (see Appendix A). These trends are expected to have continued in the sixties. The need for the supervisory and administrative personnel could be taken to have grown with the growth of the economy and with the expansion of government activities during 1960's; personnel requirements could be assumed to have increased rapidly in practically every professional field. While the numbers of clerical and sales workers must have increased, technological developments in office work (electronic computers and other modern equipment) and, in the case of sales workers, self-service and other improved techniques, perhaps, had a somewhat restraining effect on manpower requirements in these two fields during the sixties. As for the blue collar division, while the number of skilled manual workers could be assumed to have increased as a result of growing requirements for crafts-

men, mechanics and repairmen, foremen and related workers in production process, the need for unskilled manual workers must have declined as a result of technological changes. Consequently, it is assumed that the blue collar workers as a category might have declined in relative position while increasing in absolute terms. With regard to both the transportation and communication workers, and service and recreation workers, one could expect that during the sixties increasing number of workers has entered these occupations as the past trends would suggest. In the case of primary occupations, however, the assumption underlying the projections is that while the relative position of the work force in this category has declined, the absolute number has remained more or less the same since 1961. This is because, the fishing industry which employs the largest number of workers among the primary occupations has not undergone any technological change during the sixties.

As pointed out earlier, it is necessary to make an integrated forecast for all the major occupational categories within the framework of the expected total supply of labour force in 1971. Two steps are involved in estimating the total supply of labour: (1) the projection of male and female population with a view to finding out total population of 14 years of age and above, and (2) the projections of participation rates for male and female work force in the terminal year with a view to estimating the total supply of labour in 1971.

While projecting the population, instead of employing the standard component method - i.e., projecting separately the basic components of change, namely, births, deaths and migration - the approach employed here was to formulate survival rates, which could be explained by a simple example:

1961 female population, age group 10-14: 29209
1966 female population, age group 15-19: 27055
survival rate $\frac{27055}{29209} = .9262$

The above procedure was carried out for all age groups for the periods 1951-56, 1956-61 and 1961-66. An average rate was formulated from these figures and applied to the 1966 population figures in order to project the Newfoundland population for 1971.[1] The birth rate (the number of live births per 1000 population) has been declining in the past fifteen years, and it was decided to use the most current rates and consequently an average rate for the years 1966 and 1967 was derived. This procedure does not ignore death rates and migration rates; they are taken into account while estimating the survival rate. Accordingly, estimates of the male and female population for 1971 are 267.0 thousand and 255.7 thousand respectively; the male and female components of population, 14 years of age and above would be 177.6 thousand and 165.8 thousand respectively. Table IV-1 gives population figures for the years 1951, 1956, 1961, 1966 and 1971, by sex.

The size and sex of the Newfoundland labour force in 1971 depends primarily upon the expected growth of its population, on the estimated participation rates of males and females as well as on the changes in the demand for labour. The general approach used in projecting the labour force has been to estimate labour force participation rates separately for the various age groups of males and females, and to apply these rates to the estimated population in each group at some future date. However, as information on participation rates by age groups are not available for Newfoundland, participation rate estimates by age group could not be

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1. See Appendix B (Part 1) for survival rates.

Table IV-1

POPULATION, NEWFOUNDLAND AND LABRADOR, BY CENSUS DIVISION AND SEX, 1951, 1956, 1961, 1966 AND 1971 (PROJECTED)

(in thousands)

Years	Male	Female	Total
1951	185.1	176.3	361.4
1956	213.9	201.2	415.1
1961	234.9	222.9	457.9
1966	252.1	241.3	493.4
1971 (projected)	267.0	255.7	522.7

Source: Historical Statistics of Newfoundland and Labrador, Queen's Printers, (St. John's) 1970, Table A-3.

ttempted here; accordingly, estimates of participation rates, only by ex, are made. Of course, the projected participation rates are the esults of a number of specific demographic and social factors which are nown to influence such rates. Table IV-2 shows the actual participation ates for the period, 1950-69, and expected rates for 1971 by sex. The rojections constitute a linear extrapolation of the trends, according o the least squares method. It is obvious from the table that while articipation rates for males have been declining, those for emales have been rising during the last twenty years. The declining rend in the male participation rates could be explained in terms of ncreased schooling since Confederation, earlier retirement from the work orce on account of the extension of the social welfare measures and the ncreased scope of private and industrial pensions; some of this reduction ight be also due to involuntary withdrawal from the labour force because the inability to find full-time or part-time jobs by older workers. sing participation rates of females, of course, is due to increased

Table IV-2

PARTICIPATION RATES FOR MALE AND THE FEMALE, NEWFOUNDLAND AND LABRADOR, FOR 1950-1971[1]

(Labour force as a percentage of the population, 14 years of age and over)

Year	Male rates	Female rates
1950	76.1	14.5
1951	74.1	14.5
1952	68.9	16.8
1953	69.7	14.8
1954	65.9	14.5
1955	66.4	16.0
1956	67.9	14.9
1957	67.9	16.3
1958	67.9	14.3
1959	68.1	15.6
1960	67.6	15.3
1961	66.4	17.0
1962	67.3	16.5
1963	67.1	19.4
1964	63.0	19.0
1965	64.8	20.8
1966	64.8	22.2
1967	63.6	23.6
1968	62.1	24.2
1969	61.0	24.7
1971 (projected)	60.6	25.3

Source: Historical Statistics for Newfoundland and Labrador, Government of Newfoundland and Labrador, 1970, Tables 2 and 3.

1. For details of the methods used in projection, see Appendix B, part 2.

participation of women, which is the common trend all over Canada. By applying the projected participation rates of males and females for 1971 to the estimates of male and female populations, 14 years of age and above, for 1971, we get a total supply of labour of 146.1 thousand (107.4 thousand males and 38.7 thousand females) in 1971.

What is striking from this study of the labour force trends is the more rapid growth of the female labour force in Newfoundland, compared to that of the male labour force. Table IV-3 shows the annual average rates of growth of the labour force for men and women separately for Newfoundland during the period.

Table IV-3

Growth of Labour Force in Newfoundland from 1951 to 1961 and from 1961 to 1971: Estimated for 1971

	Labour Force						Rate of Growth					
	Male		Female		Total		% Change			Average Annual Rate		
	No.	%	No.	%	No.	%	M	F	T	M	F	T
	.000		.000	.000								
1951	89.5	84	17.0	15	106.5							
1961	99.3	80	23.6	19	122.4		10.9	38.8	14.9	1.1	3.9	1.5
1971	107.4	73	38.7	27	146.1		8.1	63.9	19.3	0.8	6.4	1.9

Source: Historical Statistics for Newfoundland and Labrador, Government of Newfoundland and Labrador (Queen's Printers, St. John's, 1970), Tables C10 and C11.

It is very clear from the table that the average annual rate of growth of the female component of the Newfoundland labour force tends to be much higher than that of the male during the fifties and the sixties. Further, while the rate of growth of the female labour force increases from 3.9

percent to 6.4; that of the male decreases from 1.1 percent in the 1950's to 0.8 percent during the 1960's. As a result, women workers account for about 27 percent of the labour force in 1971 as compared with only 19 percent in 1961 and 15 percent in 1951; the male component of the labour force, on the other hand, declines from 84 percent in 1951 to 73 percent in 1971.

These projected figures on the labour force in Newfoundland for 1971 set the upper limit on the availability of work force in that year. Not all workers will, of course, be at all times available for employment because of inevitable frictional unemployment. On the basis of the rate of unemployment that prevailed during the expanding phase of business activity, namely, during the war and the immediate post-war years, in the province, it is assumed that 6.0 unemployment rate in the province would be consistent with the 3.0 percent unemployment rate assumed by the Economic Council of Canada as a reasonable level of full employment for the country as a whole. Making allowance for this overall 6.0 percent unemployment rate for the Province of Newfoundland, the potential civilian labour force for 1971 has been distributed among different occupational groups projected for the terminal year.

Table IV-4 presents the percentage and numerical distribution of the projected labour force for the province, by major occupational group, for the terminal year. Table IV-5 presents the numerical and percentage distribution of the labour force for 1971, by detailed occupational groups.

What is interesting from Table IV-4 is that the occupational structure of Newfoundland labour force in 1971 is closer to the 1951 occupational structure of Canadian labour force rather than to the 1961 Canadian occupational composition (see Table II-2 for Canadian figures).

Table IV-4

PERCENTAGE AND NUMERICAL DISTRIBUTION OF THE NEWFOUNDLAND LABOUR FORCE, BY MAJOR OCCUPATIONAL GROUPS, FOR 1945, 1951, 1961 AND 1971[1]

Occupations	1945		1951		1961		1971[2]	
	No.	%	No.	%	No.	%	No.	%
All occupations	112508		106540		122423		139700	
Managerial	4124	3.7	6829	6.4	8903	7.1	10620	7.6
Professional and technical	4706	4.2	5968	5.1	9478	7.7	12010	8.6
Clerical	4931	4.4	6837	6.4	9823	8.0	13270	9.5
Sales	3781	3.4	5675	5.3	7136	5.8	8940	6.4
Craftsmen, production, etc.	16956	15.1	20255	19.0	25617	20.9	28920	20.7
Labourers	8678	7.7	8549	8.0	7665	6.3	6710	4.8
Transportation and Communication	6240	5.6	8302	7.8	9020	7.4	11320	8.1
Service and Recreation	13818	12.3	10470	9.8	13212	10.8	16070	11.5
Farmers and related workers	4221	3.8	3682	3.5	1694	1.4	1820	1.3
Loggers, etc.	7264	6.5	9153	8.6	5748	4.7	6700	4.8
Fishermen, etc.	31198	27.7	18383	17.3	18756	15.3	21230	15.2
Miners, etc.	2001	1.8	2256	2.1	2213	1.8	2235	1.6

1. Methods used in projection are explained in Appendix C.
2. Assuming 6 percent unemployment rate.

NUMERICAL AND PERCENTAGE DISTRIBUTION OF THE LABOUR FORCE IN NEWFOUNDLAND, BY INDIVIDUAL OCCUPATIONS, FOR 1945, 1951, 1961 AND 1971

Occupation	1945		1951		1961		1971	
	No.	%[1]	No.	%	No.	%	No.	%
Total	112508		106540		122423		139700	
I Managerial	4124	3.70	6829	6.40	8703	7.10	10620	7.60
II Professional and technical	4706	4.20	5468	5.10	9478	7.70	12010	8.60
(1) Engineers	198	0.17	185	0.17	341	0.27	420	0.30
(a) Civil	134	67.68	84	45.40	141	41.30	155	37.40
(b) Mechanical	29	14.65	40	21.60	66	19.40	75	17.30
(c) Electrical	21	10.61	37	20.00	84	24.60	125	29.70
(d) Mining	9	4.55	14	7.60	21	6.20	20	4.90
(e) Others	5	2.53	10	5.40	29	8.50	45	10.70
(2) Scientists - chemical and geological	60	0.05	60	0.05	83	0.07	110	0.08
(3) Biologists, agricultural professionals	12	0.01	16	0.01	60	0.04	85	0.06
(4) Teachers	2599	2.31	2523	2.36	4318	3.52	5100	3.65
(a) Professors and Principals	8	0.30	18	0.70	58	1.30	90	1.80
(b) School teachers	2588	99.60	2342	92.80	4147	96.00	4945	97.00
(c) Instructors and teachers	3	0.10	163	6.50	113	2.70	65	1.20
(5) Health Professionals	600	0.53	865	0.80	1933	1.57	2725	1.95
(a) Doctors	103	17.20	140	16.20	230	11.90	275	10.20

1. Methods used in projection are explained in Appendix C.

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(b) Dentists	17	2.80	18	2.10	39	2.00	50	1.80
(c) Nurses - graduate	480	80.00	410	47.40	1348	69.70	2205	81.00
(d) Therapists	-	-	297	34.30	296	15.30	190	7.00
(6) Law Professionals	68	0.06	81	0.07	98	0.08	130	0.09
(a) Judges, magistrates	24	35.30	20	24.70	24	24.50	32	24.30
(b) Lawyers, notaries	44	64.70	61	75.30	74	75.50	100	75.70
(7) Religious Professionals	489	0.43	525	0.50	703	0.57	840	0.60
(a) Clergymen, priests and nuns	373	76.30	355	67.60	586	83.40	760	90.00
(b) Others	116	23.70	170	32.40	117	16.60	80	10.00
(8) Artists, writers and musicians	53	0.05	112	0.10	218	0.17	280	0.20
(a) Artists - commercial	5	9.40	7	6.30	16	7.30	25	8.30
(b) Authors, editors and journalists	24	45.30	48	42.80	109	50.00	160	57.20
(c) Musicians, music teachers	24	45.30	57	50.90	93	42.70	95	34.50
(9) Others	627	0.56	1101	1.03	1724	1.40	2100	1.50
(a) Architects	7	1.10	9	0.80	17	1.00	25	1.20
(b) Draughtsmen	29	4.60	44	4.00	106	6.10	160	7.70
(c) Surveyors	-	-	91	8.30	245	14.20	400	19.00
(d) Accountants, auditors	364	58.10	460	41.80	232	13.50	180	8.60
(e) Social workers	9	1.40	77	7.00	188	10.90	300	14.30
(f) Interior decorators	-	-	-	-	19	1.10	25	1.20
(g) Photographers	50	8.00	19	1.70	24	1.40	25	1.10
(h) Technicians	32	5.10	152	13.80	567	32.90	720	34.20
(i) Others	136	21.70	249	22.60	326	18.90	265	12.70

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
III Clerical	4931	4.38	6837	6.40	9823	8.00	13270	9.50
(a) Bookkeepers, cashiers	868	17.60	955	14.00	1900	19.30	3265	24.60
(b) Office Appliance operators	5	0.10	14	0.20	92	0.90	210	1.60
(c) Stockclerk, storekeeper	--	-	--	-	640	6.50	1740	13.10
(d) Shipping and Receiving Clerks	118	2.40	329	4.80	486	4.90	665	5.00
(e) Baggagemen, expressmen	12	0.20	22	0.30	10	0.10	Z	Z
(f) Ticket, station agents	95	1.90	137	2.00	214	2.20	320	2.40
(g) Stenographer, typists	1077	21.80	1553	22.70	2237	22.80	3040	22.90
(h) Others	2756	55.90	3827	56.00	4244	43.20	4035	30.40
IV Sales Occupations	3781	3.36	5675	5.30	7136	5.80	8940	6.40
(a) Foremen, trade	65	1.70	93	1.60	82	1.10	55	0.60
(b) Canvassers, etc.	15	0.40	36	0.60	105	1.50	170	1.90
(c) Commercial travellers	202	5.30	318	5.60	471	6.60	600	6.70
(d) Newsvendors	1	Z	14	0.20	26	0.40	45	0.50
(e) Service station attendants	4	0.10	68	1.20	258	3.60	490	5.50
(f) Sales clerks	3253	86.00	4560	80.40	5869	82.20	7150	80.00
(g) Salesmen, agents - Advert.	--	-	--	-	16	0.20	25	0.30
(h) Salesmen, agents - Insurance	79	2.10	76	1.10	172	2.40	230	2.60
(i) Salesmen, agents - Real Estate	11	0.30	22	0.30	28	0.40	35	0.40
(j) Salesmen, brokers - Securities	6	0.20	6	0.10	21	0.30	25	0.30
(k) Agents, brokers, appraisers	66	1.70	31	0.40	57	0.80	70	0.80
(l) Others	79	2.10	451	7.60	31	0.40	45	0.50
V Service and Recreation	13818	12.28	10470	9.80	13212	10.80	16070	11.50
(1) Protective	4307	3.83	1853	1.73	3176	2.63	4470	3.20
(a) Firemen	167	3.90	257	13.9	472	14.90	710	15.90

Z = Insignificant number

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(b) Police, detectives	411	9.50	404	21.80	554	17.40	650	14.50
(c) Guards, watchmen	435	10.10	484	26.10	605	19.00	670	15.00
(d) Officers, armed forces	86	2.00	63	3.40	203	6.40	420	9.40
(e) Other ranks, armed forces	3208	74.50	645	34.8	1342	42.3	2020	45.20
(2) Personal	7729	6.87	6213	5.83	6883	5.63	7680	5.50
(a) Stewards	--	-	163	2.60	234	3.40	325	4.20
(b) Cooks	837	10.80	1093	17.60	1073	15.60	1045	13.60
(c) Bartenders	--	-	--	-	207	3.00	460	6.00
(d) Waiters, waitresses	631	8.20	915	14.70	902	13.10	920	12.00
(e) Nurses, non-graduate	636	8.20	528	8.50	1110	16.10	1820	23.70
(f) Porters	24	0.30	38	0.60	48	0.70	60	0.80
(g) Others	5601	72.50	3476	55.90	3309	48.10	3055	39.8
(3) Athletes, Entertainers	1	Z	--	-	26	0.02	60	0.04
(4) Service, others	1781	1.58	2404	2.20	3127	2.50	3770	2.70
(a) Barbers, Hairdressers	233	13.10	265	11.00	371	11.90	480	12.80
(b) Launderers, dry cleaners	369	20.70	332	13.80	539	17.20	775	20.60
(c) Elevator tenders	9	0.50	30	1.20	43	1.40	60	1.60
(d) Janitors, cleaners	548	30.80	750	31.20	1350	43.20	2005	53.2
(e) Morticians	14	0.80	18	0.70	25	0.80	30	0.90
(f) Guides	6	0.30	15	0.60	28	0.90	45	1.20
(g) Attendants - Recreation	24	1.30	38	1.60	61	2.00	90	2.40
(h) Others	578	32.50	956	39.80	710	22.70	275	7.30
IV Transport and Communication	6240	5.55	8302	7.80	9020	7.40	11320	8.10
(1) Inspectors, Foremen - Transp.	75	0.06	189	0.17	213	0.17	280	0.20

Z = number insignificant

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(2) Airpilots, Navigators, Flight engineers	5	Z	6	Z	39	0.03	85	0.06
(3) Operators - Railroad	430	0.38	476	0.44	519	0.42	700	0.50
(a) Locomotive engineers	128	29.80	136	28.60	143	27.60	185	26.60
(b) Locomotive firemen	115	26.70	119	25.00	65	12.50	45	6.20
(c) Conductors	53	12.30	63	13.20	78	15.00	115	16.60
(d) Brakemen	133	30.90	152	31.90	221	42.60	330	47.30
(e) Switchmen, signalmen	1	Z	6	1.30	12	2.30	25	3.30
(4) Operators, water transport	1854	1.65	1935	1.80	1661	1.35	1680	1.20
(a) Deck officers	383	20.70	451	23.30	478	28.80	575	34.20
(b) Engineering officers	231	12.50	412	21.30	348	21.00	350	20.70
(c) Deck ratings	1161	62.60	998	51.60	734	44.20	615	36.70
(d) Engine room ratings	79	4.30	74	3.80	101	6.10	140	8.40
(5) Operators, road transport	3008	2.67	4420	4.14	5166	4.20	6290	4.50
(a) Bus drivers	95	3.20	250	5.70	274	5.30	310	4.90
(b) Taxi drivers, chauffeurs	549	18.30	658	14.90	647	12.50	635	10.10
(c) Driver-salesmen	--	--	--	--	486	9.40	785	12.50
(d) Truck driver	1744	58.00	2594	58.70	3491	67.60	4435	70.50
(e) Teamster	275	9.10	292	6.60	105	2.00	65	1.00
(f) Others	345	11.50	626	14.20	163	3.20	65	1.00
(6) Inspectors, foremen - Communications	14	0.01	6	Z	68	0.05	140	0.10

Z = number insignificant

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(7) Communication Occupations	854	0.76	1270	1.20	1354	1.10	1680	1.20
(a) Radio, T.V. announcers	5	0.59	22	1.70	47	3.5	85	5.2
(b) Radio, T.V. Equipment operators	124	14.52	278	22.60	351	25.90	475	28.20
(c) Telephone operators	240	28.10	322	25.40	434	32.10	625	37.20
(d) Telegraph operators	187	21.90	224	17.60	212	15.70	230	13.70
(e) Postmen - mail carriers	84	9.84	113	8.90	153	11.30	230	13.60
(f) Messemgers	214	25.06	282	22.20	156	11.50	35	2.10
(g) Others	-	-	20	1.60	1	0.10	-	-
VII Agriculture	4221	3.75	3682	3.50	1694	1.40	1820	1.30
(a) Farmers, farm workers	2809	66.55	2438	66.20	830	49.00	650	35.70
(b) Managers, foremen	27	0.64	34	0.90	27	1.60	45	2.50
(c) Gardeners, groundkeepers	-	-	13	0.40	208	12.30	460	25.40
(d) Labourers	1385	32.81	899	24.40	608	35.90	660	36.40
(e) Others	-	-	298	8.10	21	1.20	-	-
VIII Logging	7264	6.46	9153	8.60	5748	4.70	6700	4.80
(a) Foremen	136	1.87	236	2.60	210	3.70	330	4.90
(b) Forest rangers, cruisers	130	1.79	133	1.50	180	3.10	315	4.70
(c) Lumbermen - including labourers	6998	96.34	8784	96.00	5358	93.20	6055	90.40
IX Fishing, Trapping, Hunting Occupations	31198	27.73	18383	17.30	18756	15.30	21230	15.20
(a) Fishermen	30953	99.21	18092	98.4	18756	100.0	21230	100.0
(b) Others	245	0.79	291	1.60	-	-	-	-

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
X Mining, Quarrying Occupations	2001	1.78	2256	2.1	2213	1.80	2235	1.60
(a) Foremen	63	3.15	163	7.20	175	7.90	190	8.60
(b) Miners	1337	66.82	761	33.70	951	43.00	1000	44.70
(c) Timbermen	22	1.10	50	2.20	39	1.80	30	1.40
(d) Millmen	41	2.05	80	2.70	183	8.30	355	15.80
(e) Well drillers, etc.	58	2.90	88	3.90	12	0.50	-	-
(f) Labourers	388	19.39	991	43.90	509	23.00	235	10.60
(g) Quarriers, etc.	92	4.60	143	6.30	344	15.5	420	18.9
XI Craftsmen, Production Process and Related Workers	16956	15.07	20255	19.00	25617	20.90	28920	20.70
(1) Food Workers	1035	0.92	2236	2.10	2311	1.90	2375	1.70
(a) Bakers	155	14.98	155	6.90	197	8.50	240	10.10
(b) Butchers, meat cutters	99	9.57	76	3.40	177	7.70	285	12.00
(c) Meat canners, curers, packers	8	0.77	12	0.50	41	1.80	75	3.10
(d) Fish canners, curers, packers	568	54.88	1777	79.50	1732	74.90	1670	70.30
(e) *Milk and beverage processors*	*65*	*6.28*	*61*	*2.70*	80	3.50	105	4.50
(f) Others	140	13.53	155	6.90	84	3.60	-	-
(2) Rubber Workers	50	0.04	5	Z	20	0.01	30	0.02
(a) Vulcanizers	3	6.00	5	-	19	95.0	25	90.00
(b) Others	*47*	*94.00*	-	-	*1*	*5.0*	*5*	*10.00*
(3) Leather Workers	213	0.19	98	0.09	90	0.07	70	0.05
(a) Shoemakers, repairers - factory	-	-	8	8.20	34	34.40	40	60.60

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(b) Shoemakers, repairers - not in factory	106	49.77	62	63.30	42	46.70	20	30.10
(c) Others	107	50.23	28	28.50	17	18.90	10	9.30
(4) Textile workers	50	0.04	84	0.07	64	0.05	55	0.04
(5) Tailors, Upholsterers, Furriers	538	0.48	492	0.46	322	0.26	140	0.10
(a) Tailors	130	24.16	67	13.60	41	12.70	15	11.80
(b) Upholsterers	10	1.86	19	3.90	25	7.80	15	11.70
(c) Others	398	73.98	406	82.50	256	79.50	110	76.50
(6) Carpenters, Sawyers, etc.	5323	4.73	5336	5.00	5049	4.10	4750	3.4
(a) Carpenters	4479	84.14	4573	85.70	4237	83.90	3895	82.0
(b) Sawyers	175	3.29	346	6.50	532	10.50	685	14.40
(c) Cabinet, furniture makers	25	0.47	20	0.40	27	0.50	30	0.60
(d) Woodworking machine operators	142	2.67	68	1.30	84	1.70	100	2.10
(e) Inspectors, graders, scalers - wood	49	0.92	125	2.30	82	1.60	45	0.90
(f) Others	453	8.51	196	3.70	87	1.70	-	-
(7) Paper-making workers	685	0.61	943	0.88	841	0.68	670	0.48
(a) Cellulose pulp preparers	-	-	-	-	155	18.40	200	29.60
(b) Paper makers	242	35.33	336	35.60	358	41.40	320	47.6
(c) Other paper makers	332	48.47	696	52.60	296	35.20	145	21.80
(d) Chemical and related workers	111	16.20	111	11.80	42	5.00	5	1.00
(8) Printers, bookbinders, etc.	224	0.20	232	0.20	247	0.20	280	0.20
(a) Compositors, typesetters	182	81.25	150	64.70	163	66.00	180	67.30

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(b) Pressmen	3	1.34	16	6.90	33	13.40	55	19.90
(c) Others	39	17.41	66	28.40	51	20.60	35	12.80
(9) Furnacemen, moulders, blacksmiths	329	0.29	218	0.20	118	0.10	70	0.05
(a) Blacksmiths, etc.	275	83.59	183	83.90	86	72.90	45	61.80
(b) Moulders	54	16.41	35	16.10	32	27.10	25	38.20
(10) Jewellers, watchmakers, etc.	17	0.015	27	0.02	43	0.03	55	0.04
(a) Jewellers, watchmakers	17	100.0	27	100.0	39	90.7	50	87.10
(b) Others	-	--	-	--	4	9.30	5	12.90
(11) Metal Workers	1620	1.44	1615	1.51	1898	1.55	2235	1.60
(a) Machinist, machine tool setter	359	22.16	253	15.70	305	16.10	365	16.40
(b) Filers, grinders, sharpeners	24	1.48	79	4.90	24	1.30	5	0.20
(c) Millwrights	115	7.10	132	8.20	191	10.10	245	10.90
(d) Fitters, assemblers - Metal	91	5.62	19	1.20	15	0.80	10	0.40
(e) Metal work machine operators	4	0.25	54	3.30	26	1.40	5	0.30
(f) Plumbers, pipefitters	367	22.65	501	31.00	625	32.90	760	34.00
(g) Sheetmetal workers	200	12.35	173	10.70	180	9.50	185	8.20
(h) Boilermakers, platers, etc.	111	6.85	162	10.00	197	10.4	240	10.70
(i) Welders, flame-cutters	99	6.11	134	8.30	314	16.50	420	18.90
(j) Others	250	15.43	108	6.70	21	1.10	-	-

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(12) Mechanics, repairmen	1493	1.33	1865	1.75	2868	2.34	3630	2.60
(a) Mechanics and repairmen - auto	--	--	872	46.80	1527	53.20	2165	59.60
(b) Mechanics and repairmen - aircraft	--	--	121	6.50	170	5.90	190	5.30
(c) Mechanics and repairmen - office equipment	--	--	--	--	24	0.80	70	1.90
(d) Mechanics and repairmen - railroad equipment	--	--	166	8.90	145	5.10	65	1.80
(e) Others	--	--	706	37.90	1002	34.90	1140	31.40
(13) Electric and Electronic Workers	849	0.75	1147	1.07	2045	1.67	2550	1.90
(a) Electricians, wiremen, repairmen	525	61.84	544	47.40	853	41.70	905	35.40
(b) Power station operators	72	8.48	152	13.30	241	11.80	265	10.30
(c) Mechanics and repairmen - T.V. and Radio	24	2.83	69	6.00	128	6.30	170	6.60
(d) Projectionist - cinema	25	2.94	29	2.50	27	1.30	15	0.50
(e) Linemen, servicemen	203	23.91	353	30.80	783	38.30	1170	45.80
(f) Others	--	--	--	--	13	0.60	35	1.40
(14) Painters, Glaziers, Paper-hangers	610	0.54	704	0.66	856	0.69	980	0.70
(a) Painters (in construction and maintenance), paper-hangers and glaziers	--	--	704	100.0	826	96.50	910	93.00
(b) Others	--	--	--	--	30	3.50	70	1.00

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(15) Bricklayers, plasterers, etc.	445	0.40	588	0.55	1002	0.81	1400	1.00
(a) Foremen - construction	97	21.80	237	40.30	427	42.60	630	44.90
(b) Inspectors - construction	5	1.12	18	3.10	63	6.30	135	9.50
(c) Bricklayers, stonemasons, etcetera	174	39.10	149	25.30	233	23.30	300	21.30
(d) Cement, concrete finishers	29	6.52	50	8.50	68	6.80	70	5.10
(e) Plasterers and lathers	23	5.17	27	4.60	50	5.00	75	5.60
(f) Insulation appliers	-	-	-	-	14	1.40	35	2.60
(g) Construction workers	117	26.29	107	18.20	147	14.70	155	11.20
(16) Clay, Glass, Stone Workers	24	0.02	58	0.05	56	0.04	40	0.03
(a) Lens grinders and polishers	4	16.67	9	15.50	15	26.80	15	38.10
(b) Stonecutters and dressers	11	45.83	19	32.80	14	25.00	5	17.20
(c) Others	9	37.50	30	51.70	27	48.20	20	44.70
(17) Stationary engine and excavating and lifting equipment operators and related workers	993	0.88	1517	1.42	3201	26.10	3910	2.80
(a) Boiler firemen	358	36.05	424	27.90	241	7.50	125	3.20
(b) Stationary engineers	283	28.50	372	24.50	667	20.80	655	16.80
(c) Motormen - except railway	59	5.94	59	3.90	91	2.80	80	2.00
(d) Hoistmen, cranemen, derrickmen	139	14.00	310	20.40	331	10.30	330	8.50
(e) Riggers	-	-	33	2.20	126	3.90	220	5.60
(f) Excavating machine operators	39	3.93	136	9.00	987	30.8	1650	42.2
(g) Material handling machine operators	-	-	-	-	577	18.00	745	19.10
(h) Oilers, greasers	115	11.58	183	12.10	181	5.70	100	2.60

Table IV-5 Continued

Occupation	1945		1951		1961		1971	
	No.	%	No.	%	No.	%	No.	%
(18) Freight Handlers	1503	1.34	1696	1.60	2843	2.30	3490	2.50
(a) Longshoremen, stevedores	1503	100.0	1696	100.0	1488	52.30	1745	50.00
(b) Warehousemen, etcetera	--	--	--	--	1355	47.7	1745	50.00
(19) Sectionmen, trackmen	445	0.40	775	0.72	617	0.50	419	0.30
(20) Production Process Workers	510	0.45	619	0.58	1126	0.91	1540	1.10
(a) Foremen	213	41.76	377	60.90	631	56.00	740	48.00
(b) Bottlers, wrappers, labellers	151	29.61	27	4.40	291	25.80	620	40.10
(c) Paper product makers	5	0.98	--	--	10	0.90	15	1.00
(d) Photo processing occupations	7	1.37	20	3.20	11	1.00	5	0.20
(e) Inspectors, examiners, gaugers - metal	9	1.76	8	1.30	21	1.90	40	2.50
(f) Inspectors, graders, samplers	3	0.59	125	20.20	45	4.00	5	0.20
(g) Production process workers	--	--	--	--	81	7.20	125	8.00
(h) Others	122	23.92	62	10.00	36	3.20	--	--
XII Labourers	8678	7.71	8549	8.00	7665	6.26	6710	4.80
Not Stated	4590	--	681	--	3399	--	--	--

CHAPTER V

EDUCATIONAL ATTAINMENT OF THE LABOUR FORCE IN NEWFOUNDLAND

A logical sequence to the study of changing occupational composition is an analysis of the changing educational attainment of the labour force by occupational groups. However, the limitations of the educational data do not permit a detailed study of the educational attainment of the provincial labour force by occupation. Therefore an attempt will be made in this chapter at a general assessment of the educational levels on the basis of the available data. First, a brief description of the role of education in human resource development will be given, followed by a survey of the educational expansion in the Province in recent years. Lastly, an attempt will be made at a general assessment of the educational levels of the provincial labour force. However, a projection of the educational levels to 1971, comparable to that of the occupational structure attempted in the previous chapter, will not be made, as the available data are not amenable for projection.

EDUCATION AND HUMAN RESOURCE DEVELOPMENT

The significance of human resource development in economic development and the role of formal education in human resource development have been engaging the attention of economists in recent years. Human resource development is commonly defined as "the process of increasing the knowledge, the skills and the capacities of all the people in a society".[1]

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1. F. Harbinson and C. A. Myers: Education, Manpower and Economic Growth, (McGraw-Hill, New York), 1964, p. 2.

In economic terms, it could be described as the accumulation of human capital and its effective investment in the development of an economy. In political terms, human resource development prepares people for adult participation in political processes, particularly as citizens in a democracy. From the social and cultural points of view, the development of human resources helps people to lead fuller and richer lives, less bound by tradition. In short, the process of human resource development unlocks the door to modernization.

Human resources are developed in many ways. The most obvious is by formal education, beginning with primary education, continuing with various forms of secondary education, and then higher education including the colleges, universities and higher technical institutes. Secondly, human resources are also developed 'on the job' through systematic or informal training programmes in employing institutions; in adult education programmes; and through membership in various political, social, religious and cultural groups. A third process is self-development, as individuals seek to acquire greater knowledge, skills or capacities through preparation on their own initiaitive - by taking formal or correspondence courses, by reading or by learning from others in informal contacts. Motivation for self-development is directly related to the social values of the society and to incentives for training and for entering one occupation as opposed to another, as well as for learning new skills.

Economists have long been aware of the importance of human resource development, although it is only during the last decade or so that special attention is being given to the issue. For example, Adam Smith stressed the importance of education at various points in the Wealth of Nations, and he specially included "the acquired and useful abilities of all the

inhabitants or members of society"[1] in his concept of "fixed capital". Alfred Marshall emphasized the importance of education "as a national investment", and in his view "the most valuable of all capital is that invested in human beings"[2] and that "no change would conduce so much to a rapid increase of material wealth as an improvement in our schools"[3]. Modern economists, however, have not paid much explicit attention to human resources in economic development as did some of the great classical economists. Perhaps because physical capital was measurable, and a capital-output relationship was given an apparent quantitative respectability, some modern economists virtually ignored the human resource factor in economic development. But within the past ten years, a number of economists have called attention to the importance of human resources, and particularly to investments in education. For example, Theodore W. Schultz opines that "the failure to treat human resources explicitly as a form of capital, as a produced means of production, as the product of investment, has fostered the retention of the classical notion of labour as a capacity to do manual work requiring little knowledge and skill, a capacity with which, according to this notion, labourers are endowed about equally. This notion of labour was wrong in the classical period and it is patently wrong now".[4] Simon Kuznets goes on to say that measures of capital formation based on fixed capital are deficient,

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1. Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations, (Random House, Inc.) 1937, pp. 265-266.
2. Alfred Marshall, Principles of Economics, Eighth Ed., (MacMillan & Co. Ltd., London), 1930, pp. 216, 564.
3. Ibid., p. 212.
4. T. W. Schultz, "Investment in Human Capital", The American Economic Review, Vol. 51, No. 1, (March, 1961), p. 3.

because they omit expenditures for education, nonprofit research, health, recreation, etc., which "contribute to economic growth by increasing the efficiency of a complex productive system"[1]. The rediscovery of the importance of human resources by Schultz and others has led to more recent efforts to incorporate investments in education into the main stream of economic analysis. The principal approaches have been the following: (1) determination of the relationship between expenditures on education and growth in income or in physical capital formation over a period of time in one country, (2) the residual approach in determining the contribution of education to gross national product, (3) calculation of the rate of return from expenditures on education and (4) making intercountry correlations of school enrolment ratios and GNP.

While the efforts to give greater emphasis to human resources in economic theory and the attempts to measure the contribution of education to economic growth are constructive, the concept that human resource development either can or should be analysed solely in economic terms seems misleading. It does not seem to be valid to assume that the central purpose of human resource development is to maximize man's contribution to the creation of productive goods and services. Nor does it appear to be realistic to measure the return on education solely in terms of increases in individual incomes or the income of the economy as a whole. And increases in productivity should not be taken as the exclusive test of the effectiveness of human resource development. On the other hand, it is equally fallacious to argue that education and other means of human development should be considered "human rights" irrespective of their contribution to the production of useful goods and services. Human

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1. Simon Kuznets, Six Lectures on Economic Growth, (The Free Press of Glencoe, New York) 1959, p. 77.

resource development might help to increase production of essential goods and services and at the same time preserve and enhance freedom, dignity and worth of the individual.

The goals of modern societies are political, cultural and social as well as economic. Human resource development is a necessary condition for achieving all of them. A country needs educated political leaders, lawyers and judges, trained engineers, doctors, managers, artists, writers, craftsmen and journalists to spur its development. In an advanced economy the capacities of man are extensively developed; in a primitive country they are for the most part underdeveloped. In this chapter an attempt is made to analyse the educational attainment of the population in Newfoundland and its labour force in comparison with the Canadian educational levels. The purpose is to focus attention on the differences between the Province and Canada as a whole and to indicate the directions of change during the last two decades. However, lack of data on the educational levels of the labour force after 1961 by occupational groups for provinces, restricts the analysis to the period between 1945 and 1961.[1]

EDUCATIONAL EXPANSION IN NEWFOUNDLAND

The level of skill of any labour force, obviously, depends in large measure on training through basic education, through vocational instruction, and through on-the-job training. The intensity and nature of the necessary or desirable training, of course, will vary considerably with the industry and occupation of the individual. Taken as an average, it should not be difficult to conclude that a Newfoundlander has significantly less formal education and vocational training to his credit than

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1. Data on education levels of the labour force by occupational groups for different provinces are available for census years only.

his Mainland counterpart. This is bound to reflect on the productivity of the provincial labour relative to that of the Canadian labour. Some instructive statistics on educational levels may be gleaned from census material. The Newfoundland census of 1945 brings out some disconcerting facts about the amount of illiteracy that has persisted until recent years in the province. The following figures show the percentage of persons 10 years of age and older that could not read or write in 1935 and 1945 in the province.

Table V-1

PERCENTAGE OF ILLITERACY IN NEWFOUNDLAND IN 1935 AND 1945

1935		1945	
Percent could not read	Percent could not write	Percent could not read	Percent could not write
18.3	21.3	12.0	13.5

Source: Census of Newfoundland and Labrador, 1945, Vol. 1, Tables 24 and 26.

The rates of illiteracy shown above are very high for a substantially advanced society. The explanation, of course, lies largely in the isolation of many of the provincial outposts which, more particularly in the past, have been inadequately served with education facilities and also that there was no compulsory education before 1949. It is the older generation that is chiefly affected, and their mortality, no doubt, is largely responsible for the marked decline in illiteracy in the ten years from 1935 to 1945. Without question, illiteracy in Newfoundland has been considerably reduced since Confederation, although the province

is still behind the national average in adult literacy. Tables V-3 and V-4 clearly demonstrate the phenomenal expansion in education in the province in the context of the Canadian educational growth.

Before analysing the Tables some of the limitations of the data used may be pointed out. The data include only full-time enrolment at educational institutions, except for universities where data on part-time enrolment (for degree credit purposes) are included. This covers enrolment in the elementary and secondary school system (both public and private), in universities and colleges, and in other post-secondary educational institutions operated by provincial governments. Enrolment in private trade schools and vocational schools and enrolment of students at the post-secondary level who lack high school graduation standing are not included. Enrolment in certain special-purpose schools, such as schools for the deaf or otherwise handicapped, is also excluded. Thus, these data do not cover a variety of extension programmes, part-time courses (except at university level) and short courses which might go under the heading of adult education. While the data, therefore, somewhat understate the total involvement of people with formal education, they do indicate the general dimensions of growth and change.

Tables V-3 and V-4 demonstrate the rapid expansion in educational enrolment during the last twenty years in Canada as a whole, including the Province of Newfoundland. Perhaps, one of the most encompassing measurements of increased role of formal education is the rising proportion of people enrolled in schools and universities. Here the theme has been one of increasing universality both in Canada and Newfoundland in regard to elementary education. At the beginning of the 1950's, enrolment in elementary grades in Canadian schools was practically universal, but

Table V-2

CHANGES IN FULL-TIME ENROLMENT BY LEVEL OF EDUCATION, CANADA AND NEWFOUNDLAND[1], 1951-52 AND 1967-68

Level of Education	1951-52		1967-68		Absolute Change 1951-52 to 1967-68		Percentage Change 1951-52 to 1967-68	
	Canada	Newfoundland	Canada	Newfoundland	Canada	Newfoundland	Canada	Newfoundland
	,000		,000		,000			
Elementary[2]	2230	73,715	4127	125,318	+1897	+51,603	+85%	+ 70%
Secondary	395	9,983	1325	26,888	+ 930	+16,905	+235%	+169%
Post-secondary	91	379	372	5,679	+ 281	+ 5,300	+309%	+1325%
Total	2715	84,077	5825	157,885	+3109	+73,808	+115	+ 87

1. Excludes enrolment in district vocational schools in Newfoundland.
2. Includes kindergarten.

Source: Z. E. Zsigmond and C. J. Wenaas: Enrolment in Educational Institutions by Province, 1951-52 to 1980-81, Staff Study No. 25, Economic Council of Canada, January, 1970, Tables A-1 and A-9, pp. 88 and 96.

Table V-3

ENROLMENT RATIOS FOR NEWFOUNDLAND AND CANADA, 1951-52 AND 1967-68

Level of Education	Age Group	1951-52		1967-68	
		Canada	Newfoundland	Canada	Newfoundland
		%	%	%	%
Kindergarten	5	27.7	--	63.0	71.3
Elementary	6-13	106.7[1]	112.5	106.1	109.2
Secondary	14-17	46.4	51.2	86.2	74.8
Post-secondary	18-24	6.0	1.0	16.1	9.5
Total	5-24	58.1	60.2	73.4	69.7

1. Elementary enrolment of the 6-13 age group was actually more than 100 percent reflecting a number of students in elementary grades who had repeated a particular grade and accordingly were over the age of 13.

Source: Z. E. Zsigmond and C. J. Wenaas, Enrolment in Educational Institutions by Province, 1951-52 to 1980-81, Staff Study No. 25, Economic Council of Canada, January 1970, Tables A-3 and A-11, pp. 90 and 98.

enrolment at the secondary school level included only about 46 percent of those who might have been expected to attend. And, at the post-secondary level, full-time enrolment amounted to only a small minority of the Canadian population - about 6 percent of the 18-24 age group. By 1967-68 while there was naturally no scope for upward movement in elementary enrolment ratios (except in Kindergarten), important changes had taken place at secondary and post-secondary levels. Secondary enrolment ratios were approaching 90 percent, while the post-secondary full-time enrolment ratio had increased to about 16 percent of the 18-24 age group. The most distinctive feature of Newfoundland's enrolment record from 1951-52 to 1967-68 was the sharp expansion of enrolment at both ends of the educational spectrum. Kindergarten enrolment rose from nil to 11,700, and post-secondary enrolment from 380 to 5,700. In 1967-68, the kindergarten ratio was close to the national average, but the post-secondary ratio was still well below the national average as indicated in Table V-3. Moreover it should be noted that the secondary level terminates at Grade 11 in Newfoundland, so that the equivalent of Grade 12 is taken at the university and therefore swells the total of post-secondary enrolment in the province. However it should be recognized that a substantial number of Newfoundland residents attend university in other provinces. Therefore, while the Province has reached the national average in regard to elementary education and very close to the Canadian average with respect to secondary education, it lags far behind the national average in regard to post-secondary education. One interesting fact, however, about post-secondary education is that the rate of growth of post-secondary education in Newfoundland is far higher than that of Canada as a whole during 1951-68, as revealed from the Table V-2, which means that Newfoundland is fast

catching up with the Mainland in regard to post-secondary education also. According to the projections of enrolment by the Economic Council of Canada, the differences between Canada and Newfoundland in regard to post-secondary education will continue during the 1970's.[1]

EDUCATIONAL ATTAINMENT OF THE LABOUR FORCE

While the enrolment ratios and their trends over time might indicate the educational levels of the population, they do not explain the educational levels of the provincial labour force. Of course, educational attainment of any labour force at any given time is a function of demand and supply. Economic development imposes varying mix of occupations that is consistent with the new and advanced methods of production. This progress creates inevitable changes in the quantity and quality of various occupations. Various studies of occupational trends indicate that the proportion of workers performing office and administrative functions, professional tasks, or engaged in maintenance work, has been rising, whereas the relative proportions of unskilled workers have been falling. These changes, in response to the economy's developing needs for various types of workers have, in general, required an upward adjustment in the level of education and training of workers. Admittedly, it is not easy to measure the qualitative changes in the occupational mix. However, it is a fact that formal educational requirements for many occupations has been rising, because technological advances have been changing the nature and scope of many jobs. The adjustment on the level of education and

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1. Z. E. Zsigmond and C. J. Wenaas: Enrolment in Educational Institutions by Province, 1951-52 to 1980-81, Economic Council of Canada, Staff Study No. 25, January 1970, Tables A-3, A-11, pp. 90, 98.

training has been accomplished by better prepared new entrants to the labour force and by upgrading the training of the work force. However, educational attainment of labour could also be influenced by the supply of labour of different levels of education. The supply of better and highly qualified people might take care of the highly skilled and complex jobs more easily than the undertrained and poorly educated workers. Therefore supply might create its own demand to a certain extent. Irrespective of factors underlying the educational levels of any labour force, one could assert that the higher the educational levels of labour force, the greater is the productive efficiency of the economy, in addition to other non-economic advantages. An attempt is made here to analyse the changing educational levels of the provincial labour force in comparison with those of the Canadian work force. As in the case of occupational composition, the data on educational attainment are available only for three census years, namely, 1945, 1951 and 1961.

Any comparison of educational levels of the Newfoundland labour force in 1961 with any of the earlier years is severely hampered by the change in the census concept of educational attainment. While the 1961 data refer to the "highest grade attended", the data for earlier census years pertain to "the number of years attended school". To the extent that persons repeated grades, the number of years attended would exceed the highest grade attended. To put the data on a consistent basis, the years of schooling for each census year are used and the 1961 data have been adjusted on a consistent basis. This is done by combining persons who had some university education or a university degree into the class "Thirteen years and more of schooling". There is another shortcoming with the education data: no allowance is made for different types of

education or differences in quality. Given these limitations, however, it is possible to analyse the changing educational levels of the provincial labour force since 1945. One of the important indicators of educational levels is the percentage distribution of the labour force among different educational levels.

Table V-4 shows the educational composition of the provincial labour force (percentage distribution of the total labour force among the three educational levels), and the differences between the provincial and the Canadian labour forces are obvious. The proportion of the labour force by different levels of education could be taken to reflect the stock of human capital at any time and the changes in this composition over a period of time might be taken to reflect the addition to the stock of human capital. As is clear from the Table, Newfoundland labour force in the forties was far behind the Canadian counterpart in educational levels. While Canada in 1941 had about 58 percent of the labour force in the elementary education level, the Newfoundland labour force in 1945 had nearly 68 percent in this category. Further, while nearly 34 percent of Canadian labour force in 1941 was in the category of secondary education level, the provincial labour force in 1945 had around 30 percent. The differences were wider between the two labour forces in regard to post-secondary education as is clear from the table: Newfoundland had only about 2 percent in this category in 1945, and Canada had about 7 percent in 1941. However, with the rapid improvement in the educational levels of the provincial labour force during the fifties, the differences between the two labour forces had been reduced in 1961 in regard to elementary and secondary education levels, although the gap in the post-secondary education was still very high; while Canada had nearly 16 percent in the

Table V-4

PERCENTAGE DISTRIBUTION OF LABOUR FORCE BY YEARS OF SCHOOLING:
1945, 1951 AND 1961 FOR NEWFOUNDLAND AND
1941, 1951 AND 1961 FOR CANADA

	NEWFOUNDLAND				CANADA			
	1945	1951	1961	Net Change	1941	1951	1961	Net Change
Total	100.0	100.0	100.0	--	100.0	100.0	100.0	--
Under nine years	67.8	66.7	48.0	-19.8	58.1	50.7	40.9	-17.2
Between nine and twelve years	30.1	29.7	45.8	15.7	34.0	39.1	42.8	8.8
Thirteen plus	2.1	3.6	6.2	4.1	7.3	10.2	16.3	9

Source: Census of Newfoundland, 1945, Table 44; Census of Canada, 1941, Vol. VII, Table 5; Census of Canada, 1951, Vol. IV, Table 11; Census of Canada, 1961, Vol. 3, Part 1, Table 17.

post-secondary education level in 1961, the province had only about 6 percent of its labour force in this category. In regard to elementary education level both the Mainland and the province had moved closer: Newfoundland had 48 percent of its labour force and Canada, 41 percent in this category; however, Newfoundland had moved ahead of Canada regarding secondary education: nearly 46 percent of the provincial labour force as against 43 percent of the Canadian counterpart had attained secondary education level.

The rapid improvement of the education levels of the Newfoundland labour force during the 1950's can be seen from the table V-5. This table demonstrates that from 1945 to 1961, the educational levels of the Newfoundland labour force increased relatively less rapidly than in the whole of Canada during 1941-61, excepting the elementary education level. Comparing 1961 to 1945 for Newfoundland, the number in the labour force with only elementary education decreased by 23 percent, whereas it actually increased by 5 percent for Canada as a whole during 1941-61. But the number of workers with secondary education in Canada during this period increased by 90 percent, while in Newfoundland it rose by 65 percent in 1945-61. Over the respective periods, workers in the province with some university education or degrees increased by 223 percent as compared to 237 percent for Canada as a whole. However, during 1951-61, the educational levels of the provincial labour force increased more rapidly than those of the Canadian labour force during the same period. Comparing 1961 to 1951 for Canada as a whole, the number in the labour force with elementary education decreased by 1.6 percent, while it dropped by 24.2 percent for Newfoundland. The number of workers with secondary education in Canada increased by 57.8 percent, while in Newfoundland it

Table V-5

NUMERICAL DISTRIBUTION OF THE LABOUR FORCE BY YEARS OF SCHOOLING FOR NEWFOUNDLAND AND CANADA: 1945, 1951 AND 1961 FOR NEWFOUNDLAND AND 1941, 1951 AND 1961 FOR CANADA

	NEWFOUNDLAND				CANADA			
	1945	1951	1961	% Change 1945-61	1941	1951	1961	% Change 1941-61
					,000	,000	,000	
Total	103513	106540	112310	--	4196	5215	6342	--
Under nine years	70178	71071	53885	-23.0	2463	2644	2594	+5
Between nine and twelve	31169	31610	51449	+65.0	1428	2037	2714	+90
Thirteen plus	2166	3859	6976	+222.0	306	533	1034	+237

Source: Census of Newfoundland, 1945, Table 44; Census of Canada, 1941, Vol. VII, Table 5; Census of Canada, 1951, Vol. IV, Table 11; Census of Canada, 1961, Vol. 3, Part 1, Table 17.

rose by 62.8 percent. During this period, workers in Newfoundland with thirteen years of education and more, although few in number, had increased by 80.8 percent as compared with the Canadian average of 48 percent. If these trends are any indication of the developments during the sixties, the Newfoundland labour force must have moved closer to the Canadian labour force in regard to educational standards, although there might be big differences in regard to post-secondary education level.

A more systematic analysis of the educational attainment of the labou force would be to calculate the weighted average years of schooling of workers in all occupations in census years. One might consider the change in weighted average years during this period as the rate of accumulation of human capital. Table V-6 demonstrates the weighted average years of schooling by twelve occupations for the years 1945, 1951 and 1961 for Newfoundland, and for 1941, 1951 and 1961 for Canada[1]. It is clear from the table that the following occupational groups had the highest average years of schooling for Newfoundland in 1945: professional and technical - 8.7; clerical - 8.4; sales - 7.9; and managerial - 7.4. At the bottom of this classification were workers in the primary occupations with an average of 5.15 years; blue collar workers with an average of 5.20 years of schooling; transportation and communication workers, and service and recreation workers with 6 years and 6.3 years of schooling respectively. However, in 1945, none of the occupational groups in Newfoundland had a weighted

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1. The following mid-points of school years were used: elementary - 4.5 years; high school - 10.5 years; and more than high school - 14.5 years. The appropriate number of workers with a given level of education were multiplied by the mid-points and the sum total was then divided by the total number of workers in a given occupational group.

Table V-6

EDUCATIONAL LEVEL IN MAJOR OCCUPATIONAL GROUPS, NEWFOUNDLAND, 1945, 1951 AND 1961; AND CANADA, 1941, 1951 AND 1961

Occupation	Weighted[1] Average Years of Schooling					
	NEWFOUNDLAND			CANADA		
	1945	1951	1961	1941	1951	1961
All occupations	6.5	6.7	8.0	7.8	8.4	9.4
Managerial	7.4	8.2	9.2	9.1	9.9	10.5
Professional	8.7	11.7	12.8	12.3	13+	13+
Clerical	8.4	9.7	10.6	10.4	10.5	10.7
Sales	7.9	8.6	9.5	9.6	9.8	10.2
Craftsmen, etcetera	5.3	5.3	6.8	7.7	7.8	8.2
Labourers	5.1	5.4	6.1	6.8	6.9	7.3
Transportation and Communication	6.0	6.9	7.3	7.6	8.1	8.6
Service and Recreation	6.3	6.6	7.6	7.6	7.8	8.2
Agricultural	5.4	5.7	6.3	6.6	6.9	7.2
Loggers, etcetera	4.8	3.8	5.7	5.2	5.8	6.2
Fishermen, etcetera	5.0	5.1	5.0	5.9	6.2	6.5
Miners, etcetera	5.4	5.4	6.3	6.8	7.1	7.6

Source: Census of Newfoundland, 1945, Table 44; Census of Canada, 1941, Vol. VII, Table 5; Census of Canada, 1951, Vol. IV, Table 11; Census of Canada, 1961, Vol. 3, Part 1, Table 17.

1. The method of weighting is explained in the footnote on page 86.

average years of schooling equal to secondary education level (nine years and above), whereas, for Canada as a whole, in 1941, workers in professional, clerical, sales and managerial occupations had between nine and twelve years of education. By 1961, however, rapid improvements had been recorded by professional and technical occupations, followed by clerical, sales and managerial occupations in the province. The fastest change had occurred in the educational level of workers in the professional occupations (3.3 years), followed by managerial and clerical occupations (1.7 years) and sales occupations (1.6 years). Even in 1961, none of the occupations in Newfoundland had weighted average years of schooling equal to post-secondary education level, whereas in Canada as a whole, workers in the professional and technical occupations had reached the post-secondary education level in 1961.

If we compare the education levels of the Canadian labour force by occupation with those of the provincial labour force, it is obvious that there is a very close resemblance between the provincial labour force of 1961 and the Canadian work force of 1941. If this is any indication of the differences in the education levels of the two work forces, one could conclude that in 1961 the provincial labour force was about twenty years behind the Canadian labour force in terms of educational attainment. Unfortunately, we have no data after 1961 to know to what extent the differences between the province and the Mainland in regard to educational levels have narrowed down. However, as the analysis of the educational standards of the labour force (Table V-5) indicated, the faster improvements of educational levels of the provincial labour force in relation to those of the Canadian labour force during the fifties and possibly in the sixties, could be assumed to have narrowed down the differences between the provincial and the Canadian work forces.

SUMMARY AND CONCLUSIONS

Changes in the occupational composition of any labour force over time are the outcome of two distinct processes, namely, the shifting distribution of employment among industries due to changes in demand and, secondly, evolution in the occupational pattern within individual industries due to changes in production function and technology and in relative prices of factors used. Economic development imposes varying mix of occupations that is compatible with the new and advanced methods of production. This progress creates inevitable changes in quantity and quality of various occupations. Given these complex forces that determine the occupational composition, it is revealed in the foregoing analysis that the Newfoundland labour force has undergone significant changes in its occupational structure since 1945. The analysis has been carried out in terms of the twelve occupational groups adopted by the 1961 Census of Canada, and occupational composition has been defined as the percentage distribution of the total labour force among these twelve occupations.

The single most dramatic change that has occurred in the occupational composition of the provincial labour force since 1945 is the shift away from fishing, trapping and hunting which constituted nearly 28 percent of the work force in 1945. Not long ago, Newfoundland was largely a fishing community, and by 1945 while a majority of Newfoundlanders were engaged in non-fishing pursuits, fishing occupations were far and away th largest single group in the economy. Fishing and other resource-based occupations comprised almost 40 percent of the work force in 1945, and the relative size of this group declined to 23 percent in 1961.

Looking at fishing only, the absolute as well as relative decline in size was so steep during 1945-61 that fishing lost its place as the largest single occupational activity, being replaced by "craftsmen, production process and related workers".

The reasons for the relative as well as the absolute decline of the primary occupations in general and fishing group in particular could be summarized as follows: low income-elasticity of demand for fish products, unstable export markets, low level of income in fishing relative to other occupations, expanding job opportunities off the fishing industry and outmoded methods of production; mechanization and rationalization of pulp mills and logging operations; abandonment of supplementary subsistenc farming in the wake of increasing opportunities of employment in other fields, cheapened food imports from Canada since Confederation and commercialization of agriculture.

As against this trend, there has been a spectacular rise in the labour force share of the white collar workers since 1945. Over the period 1945-1961, the white collar category rose faster, both in absolute and relative terms, than any other major occupational group. In absolute terms, it increased by 100 percent, as compared to only 9 percent rise in the civilian labour force of the province during the same period; relatively, it rose by 13 percent, the largest relative rise in the total labour force in this period. As a result, the white collar occupation's share of the labour force increased from 1.5 persons out of every ten workers in 1945 to the ratio of more than three persons out of every ten workers in 1961.

Within the major division of the white collar occupations, managerial occupations experienced the fastest rate of growth, followed by

professional and technical, clerical and sales occupations in succession. The increase in managerial occupations involved a doubling in its size between 1945-1961, mainly as a result of expansion in activities like trade and finance in which managerial occupation forms a major portion of their work force and, secondly, due to a general shift in occupational structures of the individual industries in favour of managerial and other white collar occupations. Professional and technical occupations experienced the second highest growth rate, almost doubling its size during 1945-61, reflecting rapid technological changes in industries which increasingly require services of technically and scientifically trained personnel in production, distribution and research, and also due to expansion in government and community services requiring professional workers.

The clerical occupations which increased by 99 percent, in absolute terms, in this period, reflected the expansion in record-keeping activities, office equipment and communications to meet the complex requirements of modern business organizations. Sales occupations which also recorded substantial rise indicate the expansion in trade activities in this period.

The blue collar occupational group which includes manual and semi-skilled workers, outside of agriculture, fishing, logging and mining industries, increased at less than one-third the rate of white collar occupations, as a result of greater employment of craftsmen indicating the expanding requirements for mechanics and repairmen of all kinds to install, maintain and service the growing complex of new and improved machinery and equipment.

Transportation and communication occupations recorded an increase of more than forty-four percent during this period due to developments in

road transport and communications in the province especially after Conf eration. The service and recreation category, on the other hand, decli both in absolute and relative terms, mainly as a result of a cut in the armed forces stationed in Newfoundland after the World War II; during 1951-61, there was an upward shift in the size of this group as a resu of expanding need for services in a growing economy.

While the behaviour patterns of these occupational categories a more or less similar to those of Canada, as a whole, and of Nova Scoti in particular, a comparative analysis reveals certain interesting con- clusions. The most important difference between the provincial labour force, on the one hand, and those of Canada and Nova Scotia, on the ot is the time-distance in terms of occupational composition. The overa occupational structure of the provincial labour force in 1945 was sim to those of Canadian and Nova Scotian labour forces in 1941: primary occupations formed the major proportion of the respective labour forc followed by blue collar and white collar occupations in succession. However, fundamental structural changes occurred in the Canadian and Nova Scotian labour forces during the decade, 1941-1951: the white cc occupations, which occupied relatively an insignificant position in in both the cases, rose to a position of predominance in 1951, follo by blue collar and primary occupations in that order - in fact, 1941 structure was reversed in 1951 in the case of both Canadian and Nova Scotian labour forces. On the other hand, the occupational composit of the Newfoundland labour force in 1951 continued to be the same as 1945. It was during the next decade (1951-61), that the provincial force underwent the same structural change experienced by the Canadi and the Nova Scotian labour forces during 1941-51, thereby putting

provincial labour force behind the latter by about a decade.

During the period under study, however, many of the occupational groups in the provincial labour force changed faster than those of the Mainland counterpart and of Nova Scotia. The provincial white collar group as a whole, craftsmen and production process category, transportation and communication group recorded a faster rate of growth than those for Canada and Nova Scotia. Similarly, the primary workers in the province declined at a much faster rate than in Canada and Nova Scotia. One could, perhaps, explain this in terms of rapid economic change in the provincial economy, particularly since Confederation. However, in spite of these differences, the direction of occupational shifts was the same in Canada, Nova Scotia and Newfoundland, during this period, reflecting, perhaps, the underlying common socio-economic forces.

A supply and demand analysis of the occupational composition of the provincial labour force, during this period, reveals whether the shifts in demand and supply curves were primarily responsible for changes in the occupational composition. Over the period 1945-61, as a whole, shifts in supply curves appear to have been dominant for most occupations. Increases in supply dominated changes in all the white collar occupations, craftsmen, production process and related workers and transportation and communication occupations, while decreases in supply dominated the changes among service and recreation occupations. An increase in demand appears to be the most important factor for changes in miners, quarrymen and related workers, while changes in logging, fishing and agricultural occupations were dominated by decreases in demand.

However, the most interesting developments were the periodical changes in each occupation:

(1) Between 1951-1961, increases in demand had the greatest impact on professional and technical occupations. In the previous decade, supply changes had been dominant.

(2) Increases in supply dominated, both in 1945-1951 and 1951-1961, the rapid and continued increase in the proportion of the labour force in managerial, clerical and sales occupations among the white collar occupations, and craftsmen, production process workers among the blue collar group.

(3) Supply changes were dominant behind increases in the proportion of manual labourers, and also transportation and communication workers during 1945-51, whereas in the next decade, reduction in demand was the most important factor in determining the proportion of both the categories in the total labour force.

(4) In the case of service and recreation occupations, both demand and supply factors were neutral during 1945-51. Between 1951-61, increase in demand dominated the rapid increase in the proportion of this category of workers among the total labour force.

(5) During 1945-51, when agricultural workers suffered a decline in the proportion of the total labour force, decrease in demand was the most important factor, whereas a decrease in supply was the most dominant element in the next decade.

(6) In the case of loggers and related workers, increases in supply dominated the increase in their proportion of the total labour force during 1945-51. A decline in supply of these workers was the most dominant element behind a decrease in their proportion between 1951 and 1961.

(7) Decreases in demand dominated the rapid and continued decline

in the absolute and the relative proportions of fishermen and related workers since 1945.

(8) While supply factor dominated the increase in the proportion of miners and related workers during 1945-51, increases in supply and demand for this category were approximately equal during the next decade.

A projection of the occupational composition of the provincial labour force in 1971 has been attempted along the following lines: first, the potential supply of labour in 1971 has been estimated (1) by projecting the population of 14 years of age and above, and (2) then applying the projected labour force participation rates to the population in 1971. Accordingly, it is estimated that the labour supply in 1971 would be around 146,000. Assuming 6.0 percent unemployment rate, the rest of the labour force has been distributed among the projected occupational groups for 1971. The occupational composition of 1971 and the distribution of the potential labour supply is as follows:

Occupations	Labour Force	Percentage Distribution
1. Managerial	10,620	7.6
2. Professional and technical	12,010	8.6
3. Clerical	13,270	9.5
4. Sales	8,940	6.4
5. Craftsmen, production process and related workers	28,920	20.7
6. Labourers	6,710	4.8
7. Transportation and Communication	11,320	8.1
8. Service and Recreation	16,070	11.5
9. Farmers and related workers	1,820	1.3
10. Loggers and related workers	6,700	4.8

Occupations	Labour Force	Percentage Distribution
11. Fisherman and related workers	21,230	15.2
12. Miners, etc.	2,235	1.6

The level of skill of any labour force depends in a large measure on training through education, vocational instruction, and on the job training. Taken on an average, it is found that a Newfoundlander has significantly less formal education to his credit than his Mainland counterpart. Without question, education levels of the people of the province have improved since Confederation, but there is a large gap between the two in regard to post-secondary education. At the beginning of the 1950's, enrolment in elementary grades in Canadian schools was practically universal, but included only about 46 percent of those who might have been expected to attend, at the secondary level. At the post-secondary level, full-time enrolment amounted to about 6 percent of the 18-24 age group. By 1967-68, while there was naturally no scope for upward movement in elementary enrolment ratios, important changes had taken place at secondary and post-secondary levels: secondary enrolment ratio was approaching 90 percent, while post-secondary full-time enrolment ratio had risen to about 16 percent of the 18-24 age group. The most distinctive feature of the Newfoundland's enrolment record from 1951-52 to 1967-68 was the sharp expansion at both ends of the educational spectrum. Kindergarten enrolment ratio rose from nil to 71 percent, surpassing the national average. So far as elementary education is concerned, the province had already achieved universal elementary education level in 1951-52. Regarding secondary education, the province recorded significant expansion from 51 percent of the relevant age group in 1951-52 to 75 per-

cent in 1967-68, lagging behind the national average by about 11 percent. However, it is with regard to post-secondary education that Newfoundland was far behind the Canadian average and continues to do so at present. Its enrolment ratio in 1951-52 was only about 1 percent of the 18-24 age group as against 6 percent in Canada and, in 1967-68, the ratio had risen to only 9.5 percent against 16 percent of the national average.

While the educational levels of the provincial population have been expanding at a rapid rate, although lagging behind the Canadian average regarding post-secondary education, there were wide differences between the education levels of the provincial labour force and those of Canadian labour force during the period 1945-61. While Canada, as a whole, had about 58 percent of its labour force in the elementary education level in 1941, the Newfoundland labour force, in 1945, had nearly 68 percent in this category. Further, nearly 34 percent of the Canadian labour force was in the secondary education level in 1941, while the Newfoundland counterpart had about 30 percent in that category in 1945. The differences were wider with regard to post-secondary education level: Newfoundland had only about 2 percent of its labour force, while Canada had about 7 percent, five years earlier. With rapid improvements in education in the province during the fifties, the differences between the provincial and the National work forces had narrowed down in 1961, especially regarding elementary and secondary education levels: Newfoundland had 48 percent of the labour force in the elementary education level, whereas Canada had about 41 percent in 1961. Regarding secondary education level, the Newfoundland labour force had moved ahead of Canadian labour force in 1961: nearly 46 percent of the provincial labour force was in this category against 43 percent of the Canadian counterpart. However, Newfoundland

labour force lagged far behind Canada in regard to post-secondary education level in 1961: while Canada had nearly 16 percent in this category Newfoundland labour force had only about 6 percent.

A more systematic analysis of the educational attainment of the la force is to calculate the weighted average years of schooling of workers in all occupations. Accordingly, the following occupations in Newfoundland had the highest average years of schooling in 1945: professional and technical - 8.7; clerical - 8.4; sales - 7.9; and managerial - 7.4 years. At the bottom of this classification were workers in the primary occupati with an average of 5.15 years of schooling; blue collar workers with an average of 5.20 years; transportation and communication workers, and service and recreation workers with 6 years and 6.3 years, respectively. In 1945, none of the occupational groups in the province had a weighted average years of schooling equal to secondary education level (nine years and above), whereas, for Canada as a whole, workers in professional and technical, clerical, sales and managerial occupations had between nine and twelve years of education in 1941. By 1961, however, rapid improvements had been recorded by professional and technical occupations in the province, followed by clerical, sales and managerial occupations. Even in 1961, none of the occupations in Newfoundland had a weighted average year of schooling equal to post-secondary education level, while in Canada workers in the professional and technical occupations had reached the post-secondary education level in 1961.

A comparison of the education levels of the National and the provincial labour forces, by occupation, reveals that there is a close resemblance between the provincial labour force of 1961 and the Canadian labour force in 1941. If this is any indication of the differences in

the education levels, one could conclude that the Newfoundland labour force in 1961 was behind the Canadian labour force by about 20 years, in terms of educational attainment. Unfortunately, there are no data after 1961 to ascertain as to what extent these differences have narrowed down during the sixties.

APPENDIX A

Numerical distribution of the labour force by Occupation Division, comparable major occupation groups and classes, as of 1961, for Newfoundland, 1945 and 1961 censuses, showing the percentage increase for the period 1945-1961.

Occupation Division	1945 Census	1961 Census	% Change 1945-1961
All occupations	112,508	122,423	9.0
I Managerial occupations	4,124	8,703	111.0
II Professional and technical occupations	4,706	9,478	101.4
(1) Professional engineers	198	341	72.2
(2) Biologists and agricultural professionals	12	60	400.0
(3) Scientists - chemical and geological	60	83	38.3
(4) Teachers	2,599	4,318	66.1
(5) Health Professionals	600	1,933	222.1
(6) Law Professionals	68	98	44.1
(7) Religious Professionals	489	703	43.7
(8) Artists, writers and musicians	53	218	311.3
(9) Others - architects, draughtsmen, actuaries, statisticians, photographers, etc.	627	1,724	174.9
III Clerical Occupations	4,931	9,823	99.2
(1) Bookkeepers, cashiers	868	1,900	118.8
(2) Office appliance operators	5	92	1740.0
(3) Stock clerks, storekeepers	--	640	--
(4) Shipping and receiving clerks	118	486	311.8
(5) Baggagemen and expressmen - Transport	12	10	-16.6

Occupation Division	1945 Census	1961 Census	% Change 1945-61
Clerical Occupations (Cont'd)			
(6) Ticket, Station and express agents - Transport	95	214	125.2
(7) Stenographers, typists and clerk-typists	1,077	2,237	107.7
(8) Clerical occupations - not elsewhere stated	2,756	4,244	53.9
IV Sales Occupations	3,781	7,136	88.7
(1) Foremen - trade	65	82	26.1
(2) Canvassers and other door-to-door salesmen	15	105	600.0
(3) Commercial travellers	202	471	133.1
(4) Newsvendors	1	26	2500.0
(5) Service station attendants	4	258	6350.0
(6) Sales clerks	3,253	5,869	80.4
(7) Advertising salesmen and agents	--	16	--
(8) Insurance salesmen and agents	79	172	117.7
(9) Real estate salesmen and agents	11	28	154.5
(10) Security salesmen and brokers	6	21	250.0
(11) Brokers, agents and appraisers	66	57	-13.6
(12) Others	79	31	-60.7
V Service and Recreation Occupations	13,818	13,212	-4.3
(1) Protective Service	4,307	3,176	-26.2
(a) Firemen, fire protection	167	472	182.6
(b) Policemen and detectives	411	554	34.7
(c) Guards, watchmen	435	605	39.0

Occupation Division	1945 Census	1961 Census	% Change 1945-61
(d) Commissioned officers, armed forces	86	203	136.0
(e) Other ranks, armed forces	3,208	1,342	-58.1
(2) Personal Service	7,729	6,883	-10.9
(a) Stewards	--	234	--
(b) Cooks	837	1,073	28.1
(c) Bartenders	--	207	--
(d) Waiters and waitresses	631	902	42.9
(e) Nursing assistants and aids	636	1,110	74.5
(f) Porters, baggage and pullman	24	48	100.0
(g) Kitchen helpers and others	5,601	3,309	-40.9
(3) Athletes, entertainers and related workers	1	26	2500.0
(4) Other Service Occupations	1,781	3,127	75.5
(a) Barbers and hairdressers	233	371	59.2
(b) Launderers and dry cleaners	369	539	46.0
(c) Elevator tenders, building	9	43	377.7
(d) Janitors and cleaners	548	1,350	146.3
(e) Funeral directors and embalmers	14	25	78.5
(f) Guides	6	28	366.6
(g) Attendants, recreation and amusement	24	61	154.1
(h) Service workers	578	710	22.8
VI Transport and Communication Occupations	6,240	9,020	44.5
(1) Inspectors and foremen - transport	75	213	184.0
(2) Air pilots, navigators and flight engineers	5	39	680.0
(3) Railroad operators	430	519	20.6
(4) Operators - water transport	1,854	1,661	-10.4

Occupation Division	1945 Census	1961 Census	% Change 1945-61
VI (5) Operators - road transport	3,008	5,166	71.7
(6) Inspectors, foremen - Communications	14	68	385.7
(7) Communication occupations	854	1,354	58.5
(a) Radio and T.V. announcers	5	47	840.0
(b) Radio and T.V. equipment operators	124	351	183.0
(c) Telephone operators	240	434	80.8
(d) Postmen and mail carriers	84	153	82.1
(e) Telegraph operators	187	212	13.3
(f) Messengers	214	156	-27.1
(g) Others	--	1	--
VII Agriculture	4,221	1,694	-59.8
(a) Farmers and farm workers	2,809	830	-70.4
(b) Managers, foremen	27	27	0.0
(c) Gardeners and ground keepers	--	208	--
(d) Labourers	1,385	608	-56.1
(e) Others	--	21	--
VIII Loggers and related workers	7,264	5,748	-20.8
(a) Logging foremen	136	210	54.4
(b) Forest rangers and cruisers	130	180	38.4
(c) Lumbermen, including labourers in logging	6,998	5,358	-23.4
IX Fishing, Trapping and Hunting	31,198	18,756	-40.0
(a) Fishermen	30,953	18,756	-39.4
(b) Others	245	--	--
X Miners, Quarrymen and related workers	2,001	2,213	10.5
(a) Foremen	63	175	177.7
(b) Prospectors	34	7	73.0
(c) Timbermen	22	39	77.2
(d) Miners	1,337	951	-28.8
(e) Millmen	41	183	346.3
(f) Well drillers	58	12	-82.1
(g) Labourers, mine	388	509	31.1
(h) Quarriers and related workers	58	337	481.0

Occupation Division	1945 Census	1961 Census	% Change 1945-61
XI Craftsmen, Production Process and related workers	16,956	25,617	51.0
(1) Millers, bakers, brewers and related food workers	1,035	2,311	123.2
(2) Tire builders, vulcanizers and other rubber workers	50	20	-60.0
(3) Leather cutters, lasters, sewers and other leather workers	213	90	-57.7
(4) Spinners, weavers, knitters and related workers	50	64	28.0
(5) Tailors, furriers, upholsterers and related workers	538	322	-40.1
(6) Carpenters, cabinetmakers, sawyers and relative workers	5,323	5,049	- 5.1
(7) Paper makers, still operators, chemical and related workers	685	841	22.7
(8) Printers, bookbinders and related workers	224	247	10.2
(9) Furnacemen, moulders, blacksmiths and related metal workers	329	118	-64.1
(10) Jewellers, watchmakers and engravers	17	43	152.9
(11) Machinists, plumbers, sheet metal workers and related workers	1,620	1,898	17.1
(12) Mechanics and repairmen	1,493	2,868	92.0
(13) Electricians and related electrical and electronic workers	849	2,045	140.8
(14) Painters, paperhangers and glaziers	610	856	40.3

Occupation Division	1945 Census	1961 Census	% Change 1945-61
XI (15) Bricklayers, plasterers and construction workers	445	1,002	125.1
(16) Clay, glass and stone workers	24	56	133.3
(17) Stationary engine and excavating and lifting equipment operators and related workers	993	3,201	222.3
(18) Longshoremen and other freight handlers	1,503	2,843	89.1
(19) Sectionmen and trackmen	445	617	38.6
(20) Other production process and related occupations	510	1,126	120.7
XII Labourers	8,678	7,665	-11.6
Not Stated	4,590	3,399	-25.9

Source: Census of Newfoundland and Labrador, 1945, Table 1; Census of Canada, 1961, Table 8, (94-551).

APPENDIX B

Part IA

SURVIVAL RATES FOR MALE POPULATION

MALE POPULATION			
Age Group	Population 1966	Survival Rate	Population 1971
Births 1961-71	33,483	.9079	--
0 - 4	33,244	1.0062	31,766
5 - 9	34,090	.9949	35,520
10 - 14	32,199	.9736	33,916
15 - 19	27,252	.8305	31,349
20 - 24	17,668	.9122	22,633
25 - 29	14,246	.9325	16,117
30 - 34	13,211	.9804	13,284
35 - 39	13,196	.9629	12,952
40 - 44	12,523	.9469	12,706
45 - 49	12,175	.9538	11,858
50 - 54	10,910	.9235	11,613
55 - 59	8,783	.9066	10,075
60 - 64	6,343	.8925	7,963
65 - 69	5,057	.8102	5,661
70 - 74	3,989	.7452	4,097
75 - 79	2,709	.5805	2,973
80 - 84	1,614	.4752	1,573
85 - 89	643	.2624	767
90 +	216	---	225

APPENDIX B

Part IB

SURVIVAL RATES FOR FEMALE POPULATION

FEMALE POPULATION			
Age Group	Population 1966	Survival Rate	Population 1971
Births 1966-71	33,483	.9123	--
0 - 4	33,244	.9997	30,547
5 - 9	32,917	.9901	33,234
10 - 14	31,332	.9407	32,591
15 - 19	27,055	.8381	29,474
20 - 24	18,308	.9012	22,674
25 - 29	13,685	.9639	16,499
30 - 34	12,157	.9960	13,191
35 - 39	12,080	.9501	12,108
40 - 44	11,228	.9724	11,477
45 - 49	10,939	.9634	10,918
50 - 54	9,843	.9502	10,539
55 - 59	7,575	.9244	9,353
60 - 64	5,964	.9223	7,002
65 - 69	5,204	.8628	5,501
70 - 74	4,199	.7582	4,490
75 - 79	2,866	.6078	3,184
80 - 84	1,654	.5261	1,742
85 - 89	735	.2930	870
90 +	286		299

APPENDIX B

Part II

METHODOLOGY FOR PROJECTING THE PARTICIPATION RATES

(1) Data on male and female participation rates were obtained for the period 1950-69.

(2) To find the projection, tables were set according to the 'least squares method' of linear regression such that each year from 1950 to 1969 was numbered from 0 to 19. Participation rates for male and female (in the Y column) were listed and the X^2 and XY values were derived. (Formula: (1) $\Sigma(Y) = Na + b\Sigma(X)$; (2) $\Sigma(XY) = a\Sigma(X) + b\Sigma(X^2)$)

(3) After summing each column, each summation was substituted into the appropriate place in the given linear equations and the coefficient values were worked out.

(4) Using the coefficient values in the final equation, solution was found to the projected year X(1971) by giving it the appropriate consecutive value. This procedure was repeated for both sets of participation rates.

APPENDIX C

METHODOLOGY USED IN PROJECTING THE OCCUPATIONAL STRUCTURE, 1971

The data on labour force were obtained from the 1945, 1951 and 1961 censuses and compiled according to the occupational classification given in the 1961 census. The distribution of the occupational groups in percentage terms was derived. Each occupational sub-group was also taken as a percentage of the total labour force and each individual occupation was distributed as a percentage of its sub-group.

The occupational structure has been projected according to two methods:

(a) The main twelve occupational groups have been projected with an approximate growth rate derived from the Canadian occupational trends during the years 1901 to 1961. This trend has been used because of lack of data with which to project accurately Newfoundland trends, and it was felt that Newfoundland will conform approximately to the Canadian secular trends.

(b) The sub-groupings and the individual occupations has been projected so as to conform as closely as possible to the past trend. It is assumed that the change in percentage distribution occurring between 1945, 1951 and 1961 will continue. In many instances this assumption leads to negative percentage figures. To remove this difficulty, it has often been necessary to revise the projected figures subjectively to make them conform.

Given the projected labour force for 1971, and assuming 6.0 percent unemployment rate, it has been possible to calculate the numerical

distribution of the total labour force among different individual occupations for 1971.

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